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EDITORIAL NOTICES

An Address.¹

MEDICINE PAST AND PRESENT.

By H. MORLEY FLETCHER.

BEFORE I begin my discourse I feel I must refer to the loss the world has recently sustained by the death of those two great scientists, Rutherford and Elliot Smith—both of them Fellows of the Royal College of Physicians and both Australians. They were singularly alike in their simple warm disposition and personal charm. I am glad to be able to say that I knew them both. This city may well be proud of Elliot Smith, who was a native of New South Wales and spent his early life in

Sydney; New Zealand of Rutherford—the one the foremost anatomist, and the other the leading physicist, of the century; they have left a lasting memorial in their work.

On an occasion of such importance as the present one, which marks the foundation of a great centre for the advancement of medical science in Australasia, I felt it might be of interest to contrast the astonishing progress made in medical knowledge in quite recent years with its almost complete stagnation during the preceding centuries.

In order to make this contrast clear to my non-medical hearers, and also to show what increasingly great service medical science is rendering to the public, I propose to give a brief survey of what may be called "medicine past and present", or "physic then and now".

In the year 1500, Henry VIII was on the English throne. Medical knowledge had made little or no progress for the past 1,000 years, and must have

¹ Delivered at the inaugural meeting of the Royal Australasian College of Physicians, at the Great Hall of the University of Sydney, on December 14, 1938.

been of very little use to the general public. The most capable practitioners at that time were monks; the rest were apothecaries, leeches, charlatans and astrologers. The apothecary is well described by Shakespeare in the familiar lines:

In tattered weeds with overwhelming brows,
Culling of simples; meagre were his looks,
Sharp misery had worn him to the bones.
And in his needy shop a tortoise hung,
An alligator stuffed and other skins
Of ill-shaped fishes; and about his shelves
A beggarly account of empty boxes,
Green earthen pots, bladders and musty seeds,
Remnants of pack-thread and old cakes of roses
Were thinly scattered, to make up a show.

But times were changing rapidly. The Renaissance was in full tide. The ancient learning of the Greeks, particularly the works of Hippocrates, Aristotle and Galen, had been lost to Europe for many years, though they had been preserved and studied in the East by the Arabs and Jews and translated into Arabic, Persian and Hebrew. When the Arabs overran North Africa and the greater part of Europe in the seventh century they brought their books with them. They founded the University of Cordova in the eighth century. The Arabian power and influence continued into the thirteenth century and led to the revival of learning in the West and to the study of the ancient literature. Such universities as existed became crowded with eager students. Linacre, of Oxford, was one of those who went abroad in search of the New Learning and, like other Englishmen, he studied at Padua, where he graduated as M.D. in 1500. After his return to England he became an M.D. of Oxford, tutor to Sir Thomas More and Erasmus, and later physician to Henry VIII. He was preeminently a scholar rather than a physician, and we remember him chiefly as a reformer of medicine in England. Largely through his influence with King Henry VIII the charter was granted in 1518 for the foundation of the Royal College of Physicians. This included powers for the regulation of the practice of physic, and for punishment of offenders, at first in London, but in 1522 for the whole country. Linacre was the first President of the College and held that office from 1518 to 1522. He was a priest, a scholar, a teacher and a far-seeing organizer.

The foundation of the college was the first step towards the regulation of medical practice in the country, and it led to the institution of lectureships in medicine. In 1618 it was responsible for the first London pharmacopœia.

We may rightly call this the first stage in the progress of medicine in England—the stage of organization, or Linacre's period.

We now come to the next period, one hundred years after Linacre, that of William Harvey, who published his great work on the circulation of the blood in 1628. This discovery may be said to have ushered in a new era—the dawn of medical research, the searching for truth by experimentation and investigation rather than the clinging to ancient worn-out theories handed down by tradition.

It has been truly said that the work of Harvey lies at the back of almost every important medical advance, and in this connexion it may be of interest to remark that every year since the death of Harvey a "Harveian Oration" has been delivered by a distinguished fellow of the college, dealing with some aspect of the life or work of the "immortal Harvey".

This second period of progress we may call the experimental stage.

And now we pass on for another fifty years or so and we find that what we call clinical medicine had its beginning, and we may call this the third or clinical stage. By clinical medicine we mean the careful study of the diseases recognized by the physicians of that day and of the symptoms and signs caused by them. Sydenham, who was born in 1624 and died in 1689, was the founder of modern clinical medicine. As Norman Moore puts it, he was the first who attempted to arrive at general laws about the prevalence and the course of disease from clinical observation.

And now there comes a gap of at least 200 years, let us say until about fifty years ago, when Queen Victoria had been half a century on the throne. More was known of the classification of diseases and of their consequences; but it is doubtful if a sufferer was better off then, except for improved sanitary conditions, than he would have been 350 years previously, with one exception: Jenner had introduced smallpox inoculation in 1798. It seems incredible that the nineteenth century, which had seen the introduction of complicated machinery, such as railways and steamers, and also the telegraph, should not have been associated with some advances in medical science. But so it was, and it was not until the closing years of the nineteenth century that a new era opened. Let us call this our fourth stage—the development of medical science.

As the result of the vast increase in our scientific knowledge the modern physician is now equipped to an extent undreamt of fifty years ago, and his attitude to disease differs greatly from that of his predecessors. Now he seeks to determine, first, the cause of a disease, secondly the best way to treat it and its consequences, and thirdly and most important, to prevent its occurrence if possible. It is with this third aim I wish to deal, as the prevention of disease must be regarded as of greater importance than its cure.

Attempts to prevent disease may be said to date back for thousands of years. In early days the wearing of charms or amulets was used to ward off illness; pomanders were carried to avoid infections, supposed protective measures employed by individuals. Even at present a lingering belief persists in such things as rheumatic rings *et cetera*, and the ancient custom of placing a bunch of flowers in front of the judge's seat in the London law courts, to ward off the plague, is an interesting survival of the same belief.

In 1500 no means had been found to protect the community, and smallpox, typhus and the plague periodically ravaged the country. Such visitations were regarded as punishments sent by the gods for

the sins of the people, and centuries had to pass before more rational views were adopted, and it was recognized that these scourges were largely due to the ignorance, stupidity and dirt of mankind.

One of the earliest attempts in preventive medicine was against smallpox. As you know, this was one of the most terrible scourges in the whole world. In England it was endemic and epidemic. No classes escaped, and a large proportion of the population had badly scarred faces as the result of the disease. The mortality rate was about 25% to 40%, varying according to age.

Early in the eighteenth century Lady Mary Wortley Montague had visited Constantinople where her husband was ambassador. She found that it had long been the custom among the Turks to inoculate healthy persons with material taken from a smallpox patient, with the result that a mild attack of smallpox followed, with little or no scarring. On her return to England in 1718 she introduced this method to her friends, and many persons of the upper class were successfully treated. An unfortunate result was that after recovery they returned to their homes and spread the infection amongst their neighbours, who were often poorer and less well nourished, and local epidemics of smallpox frequently followed. As soon as this was recognized this method of inoculation was made illegal.

We hear little more of smallpox inoculation until the American War of Independence, in which smallpox played havoc with the British troops and influenced the result of several important campaigns to a degree which perhaps has not been sufficiently recognized.

Washington, in a letter to the Governor of Virginia, one of the States opposed to inoculation, wrote:

I am induced to believe that the apprehension of smallpox and its calamitous consequences have greatly retarded enlistments. But may not those objections be easily done away with by introducing inoculation into the State? Or shall we adhere to a regulation preventing it and reprobated at this time—not only by consent and usage of the greater part of the civilized world, but of our interest and experience of its utility? You will pardon my observation on the smallpox because I know it to be more destructive to an army in the natural way than the swords, and because I shudder when I reflect upon the difficulties of keeping it out.

He wrote this in 1777, and shortly afterwards general smallpox inoculation of the troops followed. This was done systematically, regiments of 500 men at a time were sent off to be inoculated at a special camp, and ten days after recovery and careful disinfection of bodies and clothes, were returned to the army. The mortality resulting from the mild form of smallpox caused by inoculation is said to have been not more than one in 300, and many regiments of 500 men underwent it without the loss of a man. The mortality record for victims of natural smallpox was over 16%, while deaths from the disease caused by inoculation averaged one in 300.

The northern campaign, in Canada, was the converse of that in the south. The British were little affected by smallpox, while the American troops besieging Quebec were being decimated by it.

We learn that on May 1, 1776, of 1,900 men confronting Quebec, 900 were unfit for duty, most of them from smallpox. When British reinforcements arrived the American troops were forced to retire in panic, and so Quebec was saved, and with it, probably Canada.¹

This may seem a digression from my subject; but this extensive use of smallpox inoculation during the War of Independence is of considerable interest, as it does not appear to have received much attention from English writers considering the influence it may have had on the course of events. My attention was drawn to it by my friend Dr. Thursfield, who is making a special study of the subject.

The first real advance in preventive medicine was in 1798, when William Jenner published his "Enquiry into the Causes and Effects of Cowpox". After intense opposition this was followed by the universal adoption of inoculation by calf lymph, to the immense advantage of mankind.

Now there are some diseases of which we know the causes; but adequate preventive measures are well-nigh impossible. For example, take malaria. As the result of the researches of Manson and Ross we know that the disease is communicated to man by the bite of infected mosquitoes and that if we could get rid of the mosquitoes we should be delivered from this great plague. But this we cannot do effectively, and the result is that it is estimated that two million people die annually of malaria.

A vast amount of preventive work has been, and is being, done by public bodies in the way of improved dwellings, sanitation, better nutrition for infants and children *et cetera*, to the great benefit of the community as regards happiness and health and in lessened liability to disease.

It was from about 1880 onwards that great scientific advances were made. Pasteur (1822-1895), by his researches into moulds and anthrax disease, discovered the existence of those minute forms of life we now know as bacteria, and he will always be known as the first to gain an insight into the nature of infection.

Koch, in 1882, discovered the cause of tuberculosis, the tubercle bacillus, and to him we owe the technique of bacteriology.

Röntgen's discovery, in 1892, that bony structures were impervious to certain forms of light, now called X rays, gave us radiology and its wonderful aid in diagnosis and in the study of the function of internal organs.

During the lifetime of many of those now present, one discovery has followed another in anatomy, physiology, biochemistry and physics, each one opening out further fields of inquiry; but it would take too long to go into further detail.

It is justifiable to say that the progress of medical science during the last 50 to 60 years, or the lifetime of two generations, has done more to alleviate suffering, to prolong life and to improve the health

¹ James E. Gibson: "Dr. Bodo Otto and the Medical Background of the American Revolution", 1937.

of the individual than had previously been effected in the whole history of mankind.

Time will not permit me even to enumerate the benefits the public has derived from the recent advances in medical science. Most, if not all, of them have been the result of research work done in the laboratories and utilized by the physician. But I must mention some of the most striking.

First, the use of insulin in diabetes. Until Banting isolated insulin in 1922, the diabetic might be regarded as suffering from a mortal disease, rapidly fatal in the young, while the dietetic restrictions made life almost intolerable to those affected by it. Now with the help of insulin the patient can lead a practically normal life, and the disease is robbed of its terrors.

Again, let us take that terrible disease, pernicious anaemia, which was almost invariably fatal. Minot, in 1928, and Castle found that the feeding of animals with liver had a potent effect on blood formation. Further investigations as to the influence of liver feeding in various forms of anaemia showed that it had a strikingly beneficial action in that most serious form known as pernicious anaemia. As soon as this work was published the method was tried and adopted all over the world and has led to the saving of many lives. Fortunately for the comfort of the patient, extracts of liver given at intervals are now found to be more efficacious than the large amounts of raw or partially cooked liver which were used at first, and which were, to say the least of it, unpalatable.

I must say a few words about vitamins, substances discovered by Gowland Hopkins. These bodies are essential to health and normal development, and each has its own specific action. Let us consider rickets, that disastrous malady of childhood which was so prevalent in Great Britain that it was known in Europe as "the English disease". The chief characteristic of rickets is the defective formation of bone with resulting softening, so that limbs and other parts become bent and deformed. In 1918, Mellanby showed that rickets was due to the absence of one or more of these vitamins, and later Hopkins found that vitamin D was the essential factor that was lacking. Vitamin D is produced naturally by the action of sunlight on fats and other substances, and artificially by ultra-violet rays, and its administration speedily arrests the progress of rickets.

It is easy to understand why rickets is so rare in Australasia, with its profuse sunshine, and was so common in England, with its cloudy, foggy climate and its crowded, smoky cities and slum dwellings.

And now, lastly, I must tell you about a most powerful weapon of defence which has been given quite recently to medicine by the chemists. I refer to "Prontosil", or, to give it its full name, sulphanilamide. This drug has a most powerful action on certain bacteria, particularly the streptococci. Streptococci are responsible for that terrible and common disaster attending child-birth, puerperal septicemia, with its heavy loss of life. This drug "Prontosil" is proving of the greatest value in saving the precious lives of mothers.

More recently "Prontosil" has been found to have a deterrent action on other organisms, notably those causing certain forms of meningitis, and also in cases of pneumonia, and a wide field seems to be opening for the uses of this drug and its derivatives.

One could give many more examples of recent advances, such as antitoxins for diphtheria *et cetera*, which are proving of such immense value to the public; but now I must draw to a close. I have endeavoured in my brief and imperfect survey to show you how present-day medicine contrasts with that in Linacre's time, and how, owing to the rapid advances made in the allied sciences, the physician of today has been enabled to make such progress in the alleviation of the sufferings of mankind, and the improvement of the health of the community, as was undreamt of 50 or 60 years ago.

An institution such as this Royal College, whose inauguration we are celebrating today, should have immense influence in stimulating and aiding medical progress. Your colleagues, sir, at home, are confident that this college will uphold the highest ideals in the ancient and modern science and art of medicine.

May I in conclusion quote the injunctions which William Harvey gave 300 years ago to the Fellows of the Royal College in London: "to search out and study the secrets of nature by way of experiment, and for the honour of the profession to continue in mutual love and affection among themselves."

THE SEROLOGICAL TYPES OF HÆMOLYTIC STREPTOCOCCI CAUSING SCARLET FEVER IN SYDNEY.

By COLIN WHITE, G. V. RUDD and HUGH K. WARD,
in association with

F. HALES WILSON and N. J. SYMINGTON.

(From the Department of Bacteriology, University of Sydney, and Prince Henry Hospital, Little Bay, New South Wales.)

Now that Griffith's⁽¹⁾ method of classifying group A¹ hæmolytic streptococci into serological types has become generally accepted, the task of surveying the distribution of these types in various countries can go forward.

During the last few months we have been engaged in typing group A hæmolytic streptococci from various sources; but since comparable data are more readily available for scarlet fever streptococci, we are restricting this report to hæmolytic streptococci isolated from cases of scarlet fever occurring in Sydney. The work was begun in

¹ The group classification of hæmolytic streptococci we owe to Lancefield. It depends on the presence of a group-specific hapten common to all members of the group, and is detected by means of a precipitation reaction, an acid extract of the organism and a group-specific serum being used. Group A hæmolytic streptococci include practically all the hæmolytic streptococci pathogenic to human beings, though occasionally hæmolytic streptococci belonging to other groups are associated with human disease.

the winter of 1936, during a mild epidemic of scarlet fever, when we collected the strains and examined their biological characteristics. At that time we had no typing sera, so these strains were stored until we were in a position to study them serologically. In 1937 Dr. Griffith very courteously provided us with type cultures, and we proceeded to make the necessary type-specific sera and to familiarize ourselves with the technique. In 1938 we typed (a) the strains obtained in the winter of 1936, and (b) the strains isolated from cases of scarlet fever occurring in Sydney in the late summer, autumn and winter of 1938.

In the cases we studied in 1936 we took a swabbing from the patient on his admission to the hospital and again twenty-four days later. In 1938 we contented ourselves with isolating the organism present on admission to hospital only.

We present our findings concerning the distribution of the types of streptococci associated with scarlet fever in Sydney during these two periods of time and, in addition, some data showing the great frequency of cross-infection, the patients having been infected with one or more different types of streptococci during their stay in hospital. This phenomenon has been studied very carefully by Allison and Brown;⁽²⁾ and in their experience and in our own, reinfection appears to be the rule rather than the exception in the ordinary scarlet fever ward.

We also discuss a possible association between the epidemiological and the biological characteristics of certain types of hæmolytic streptococci.

Technique.

Isolation of Strains.

The patient's throat was swabbed early in the morning before any antiseptic gargle had been used. The same day the swab was spread on a special kind of blood medium made with horse serum, horse blood and neopeptone-agar, and containing no meat extract (Ward and Rudd⁽³⁾). The plate was incubated for twenty-four hours and the next day examined for hæmolytic streptococci. If any were found, the strain was isolated from a single colony and the character of the colony noted. In 1936 we preserved the strains by incubating them in Robertson's cooked meat medium (covered with a layer of paraffin oil) and putting the tubes in the ice-box. Little difficulty was experienced in recovering these strains nearly two years later. In 1938 we were able to proceed immediately to typing the current strains. If *otitis media* supervened, a swab was inserted into the external meatus and this swab was spread on a blood plate *et cetera*.

Typing.

A colony of the hæmolytic streptococcus on the blood plate was touched with a straight wire and 5.0 cubic centimetres of culture medium contained in a centrifuge tube were inoculated. The most suitable medium is tryptic broth with 0.5% ascitic fluid. This tube is incubated at 30° C. for eighteen hours; it is then centrifuged lightly (although this is unnecessary if the organisms are already at the bottom of the tube) and most of the supernatant fluid is drawn off in a pipette. About 0.3 cubic centimetre of the supernatant fluid is left on the organisms and the deposited cocci are then thoroughly emulsified; this is done by drawing the fluid and cocci up and down a capillary pipette. A number of small drops of the suspension are now placed on a clean glass

slide. To each of these drops, except one that is kept as a control of the suspension, a loopful of each typing serum is added, the slide is rocked to and fro, and agglutination is watched for with a small hand lens. Agglutination should take place within a minute or two if the typing serum is specific for the cocci in the suspension. If the control undergoes auto-agglutination, before or at the same time as agglutination is seen in any of the other drops, an attempt must be made to secure a more stable suspension. As there are a large number of different type sera, it saves time to combine them in groups of four and to use these mixtures for preliminary typing. If agglutination is seen in any of the mixtures the separate sera in the mixture are mixed with the suspension, to determine the particular type of serum that was responsible for the agglutination with the mixture.

Further details of the technique will be described in another place. It is not difficult; but one requires a little experience to feel confidence in it and to overcome the irregularities that occur, particularly in the character of the suspensions.

Results.

Since this investigation deals with the types of streptococci causing scarlet fever during two distinct periods, separated by a considerable interval of time, we report the results of each period separately.

The Winter of 1936.

There was a mild epidemic of scarlet fever in Sydney during the winter of 1936. From July 13 to September 7, swabs yielding a culture of streptococci were obtained from 315 patients admitted to hospital with the clinical diagnosis of scarlet fever. The distribution of types among these patients was as follows:¹

| | |
|--------------------|--------------|
| Type XVII | 186 patients |
| Type I | 68 patients |
| Type IV | 14 patients |
| Type VI | 11 patients |
| Type "Wade" | 11 patients |
| Type V | 1 patient |
| Type XI | 1 patient |
| Type XXV | 1 patient |
| Type "Gerrard" .. | 1 patient |
| Type "Krone" | 1 patient |
| Type "Hooper" | 1 patient |
| Untyped | 19 patients |

In 220 of these 314 cases a second swab was taken about twenty-four days after the patient's admission to hospital. In 38 cases the swabs yielded no growth. In 62 cases the same organism as the one found on admission to hospital was cultured from the swab.

In 120 cases we found one or more types other than the type cultured at the time of admission to hospital. In other words, there was evidence of reinfection in 120 out of 220 cases when the patients were examined after three and a half weeks in hospital.

Otitis media was the main complication. In 28 cases the *otitis media* was an early complication,

¹ Like Pauli and Coburn,⁽⁴⁾ we have been unable to distinguish between types XVII and XXIII, as described originally by Griffith, and we have called all these strains "type XVII". Types "Wade", "Gerrard", "Krone" and "Hooper" are new types established by us, and were not infrequently found in 1938 in Sydney.

occurring during the first two weeks of disease, and the type of streptococcus isolated from the ear was the same as that found in the throat on admission to hospital. In six cases the *otitis media* was a late complication, occurring after the second week of disease; and a different type was cultured from the ear. These findings concerning *otitis media* agree with those reported by Allison and Brown.⁽²⁾ A second rash occurred in one case. Here the organism found on admission to hospital was of type XXV, and the organism found in the throat at the time of the second rash belonged to type I.

The Late Summer, Autumn and Winter of 1938.

During the late summer, autumn and winter of 1938 there was no epidemic prevalence of scarlet fever. From March 22 to September 9, swabs yielding cultures of streptococci were obtained from 307 patients admitted to hospital with the clinical diagnosis of scarlet fever. The distribution of types was as follows:

| | |
|----------------|-------------|
| Type XI | 94 patients |
| Type IV | 49 patients |
| Type XVII | 47 patients |
| Type "Wade" | 19 patients |
| Type I | 17 patients |
| Type "Gerrard" | 13 patients |
| Type "Krone" | 13 patients |
| Type IX | 10 patients |
| Type XXV | 4 patients |
| Type X | 3 patients |
| Type XXVIII | 3 patients |
| Type XII | 1 patient |
| Type XXVII | 1 patient |
| Type "Hooper" | 1 patient |
| Untyped | 32 patients |

There are certain differences between the two periods, which can be seen better in Figure I. This

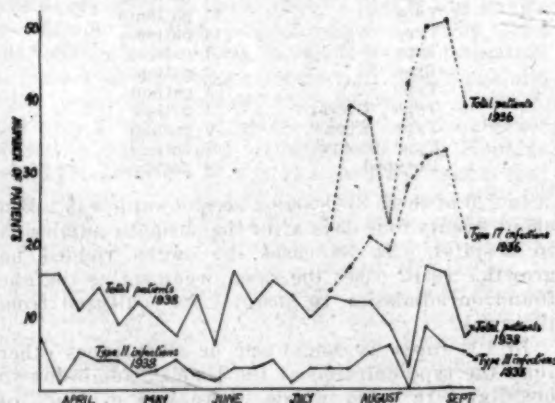


FIGURE I.

Graph showing weekly admissions of scarlet fever patients, in which the infecting organism was typed, during two periods of time: three months in 1936 and six months in 1938. The weekly incidence of infections due to the predominating type organism during these two periods is also shown.

shows in graphic form the total number of patients and the predominant type of streptococcus in each period. The mild epidemic of 1936 is indicated, and it is clear that type XVII is the

epidemic type. In 1938 there was only a very slight rise in the number of patients at the end of the winter; and type XI, which was found in only one patient in 1936, was responsible for a fairly constant proportion of the infections in 1938, though these never rose to epidemic prevalence.

Type XVII was found in a certain number of patients in 1938, but did not spread widely as it did in 1936. It is also of interest that 80% of the type XVII infections in 1938 occurred after the middle of June, that is, after the beginning of the cooler weather, whereas type XI maintained a fairly constant level of incidence throughout the late summer, autumn and winter of 1938. The possible significance of these observations will be discussed later in this paper. Clinically the disease was mild and the case mortality rate was low.

Discussion.

Distribution of Types in Sydney Compared with the Distribution of Types in England.

The data that have been obtained in England since Griffith established his serological types show that types I, II, III and IV are responsible for 60% to 70% of cases of scarlet fever in that country. In Sydney, types II and III were not found at all, and types I and IV accounted for only 25% of the infections. During the two periods, one of three months in 1936 and one of six months in 1938, types I, IV, XI and XVII were responsible for 75% of the cases of scarlet fever in Sydney.

The Organisms Prevalent in Epidemic and Non-Epidemic Periods.

Group A hæmolytic streptococci can be divided into capsulated¹ and non-capsulated cocci (Ward and Rudd⁽³⁾). In general, certain types are found to be capsulated and the remaining types non-capsulated, though occasionally both capsulated and non-capsulated cocci are found in the same serological type. The epidemic and non-epidemic periods were analysed on this basis and the distribution shown in Table I was found.

It is thus seen that capsulated organisms predominated in the epidemic period and non-capsulated organisms predominated in the non-epidemic period. In Melbourne during the winter of 1938 type II attained epidemic prevalence (E. V. Keogh, personal communication). It was a capsulated strain.

This evidence suggests that capsulated organisms have a greater tendency to spread and cause more scarlet fever in a community than non-capsulated organisms. This theory is supported by the incidence of familial infection in the two periods.

¹ Capsules can be demonstrated in the capsulated strains by the following method. The organism is cultivated for four hours in a mixture of equal parts of horse serum and 1% neopeptone solution. A drop of this culture is added to 0.25 cubic centimetre of defibrinated blood and incubated for thirty minutes. A film of the blood is spread on a glass slide and stained with 2.0 cubic centimetres of Lelshman's stain for six minutes, followed by 2.0 cubic centimetres of distilled water for four minutes. The stain is washed off with water and the film is dried and examined. The capsule appears as a definite stained structure surrounding the cocci.

TABLE I.

The Distribution of Types of Streptococci in an Epidemic and a Non-Epidemic Period.

| | Epidemic Period. (Winter of 1936.) | | Non-Epidemic Period. (Late Summer, Autumn and Winter of 1938.) | |
|----------------------------------|---|-------------------------------|--|-------------------------------|
| | Type. | Percentage of Patients. | Type. | Percentage of Patients. |
| Capsulated Organisms. | I VI XVII } | 85 | I X XVII } | 22 |
| Non- Capsulated Organisms. | IV XI "Wade" "Gerrard" "Krone" "Hooper" Untyped } | 9 | IV IX XI XII XXV XXVII XXVIII "Wade" "Gerrard" "Krone" "Hooper" Untyped } | 68 |
| | | 6 | | 10 |

In Table II, the familial infections—expressed as a percentage of the total number of infections—are analysed, and it will be seen that in both the epidemic and non-epidemic periods, approximately four times as many familial infections were caused by capsulated strains as were caused by non-capsulated strains.

TABLE II.

Familial Infections with Capsulated and Non-Capsulated Organisms in an Epidemic and a Non-Epidemic Period.

| | Epidemic Period. (Winter of 1936.) Percentage of Infections. | Non-Epidemic Period. (Late Summer, Autumn and Winter of 1938.) Percentage of Infections. |
|--------------------------|---|--|
| Capsulated organisms .. | 16.1 | 16.0 |
| Non-capsulated organisms | 3.7 | 3.2 |

The number of familial infections observed was not large, totalling 51 such infections in 488 families, and doubtless some were missed when the names of the patients were different; but there was no selection, and the difference is quite striking. Three explanations can be offered for the greater infectivity of capsulated organisms:

1. Capsulated organisms are conveyed from individual to individual more easily; although there is no evidence in favour of this theory.

2. Capsulated organisms have a greater capacity to establish themselves in the nasopharynx and to set up a definite infection of the tissues. We do not believe that non-capsulated organisms are less virulent than the capsulated strains, once the tissues are infected.

3. Capsulated organisms secrete a stronger erythrogenic toxin and are therefore more likely to cause scarlet fever in a given individual.

It must be remembered that this investigation concerns only patients with scarlet fever, and not all streptococcal throat infections. We prepared

toxin from the epidemic capsulated type XVII and from the non-epidemic non-capsulated type XI. The toxin prepared from type XVII was between four and eight times stronger than the toxin from type XI. Freshly isolated strains were used. We have also compared the toxin of type XVII with the toxin of the non-capsulated type "Hooper", with a similar result. It would be reasonable, then, to suppose that a type XVII infection would be more likely to be accompanied by a rash than a type XI infection. At the same time it must be admitted that our evidence concerning the toxin elaborated by capsulated and non-capsulated strains is very meagre, and much more work is necessary before the quantitative difference can be regarded as established.

We are inclined to think that the tendency of the capsulated strains to spread, often causing a little epidemic of scarlet fever in the family and occasionally a larger epidemic in the community, is due both to their greater infectivity (as distinct from virulence) and to their greater toxigenic capacity. We have had the opportunity of studying only one institutional epidemic of tonsillitis without rash, and that was caused by a capsulated type VI strain.

We can offer no explanation of why type XVII spread much more widely in 1936 than it did in 1938. It would be easy to suppose that the population acquired an immunity to the erythrogenic toxin or a specific immunity to type XVII in 1936, and that there were fewer susceptible individuals in 1938; but there is no supporting evidence.

Reinfection in Scarlet Fever Hospital Wards.

The evidence we obtained from swabs taken twenty-four days after admission to hospital amply confirmed previous work on the frequency of reinfection. Indeed, it would seem that reinfection is the rule rather than the exception under the ordinary conditions of housing of these patients in large wards. Reinfection could no doubt be prevented, as Allison and Brown⁽²⁾ have shown, by isolation of these patients in single-bed wards; but this would be expensive, and perhaps something of a hardship for young children. The alternative would be to have smaller wards, containing, say, four beds, and to place patients with the same type in the same ward, although it must be admitted that there is no evidence that a patient could not be reinfected with the same type. However, the modern trend in the construction of hospitals for infectious diseases is towards much smaller wards, in order to minimize the disorganization consequent on the closure of a ward. It should be possible, then, to determine whether the segregation of patients with the same type of infection, which is desirable on theoretical grounds, is a practical improvement in the management of scarlet fever.

Conclusions.

1. During a mild epidemic of scarlet fever in Sydney during the winter of 1936, the infecting strains of hæmolytic streptococci were isolated from 314 patients and typed, the serological classifica-

tion introduced by Griffith being used. Type XVII was the epidemic strain.

2. A similar survey was carried out in the late summer, autumn and winter of 1938. During this period there was no epidemic prevalence of scarlet fever. No one serological type predominated among the 307 patients. Type XI was found throughout the whole period, but its incidence remained at a fairly steady level.

3. The distribution of Griffith's types causing scarlet fever in Sydney is different from the distribution found in England. In England, types I, II, III and IV account for 60% to 70% of cases of scarlet fever; in Sydney, types I, IV, XI and XVII caused 75% of the cases of scarlet fever in the period under review.

4. If the distribution of capsulated and non-capsulated strains is compared in the epidemic and non-epidemic periods, there is a suggestion that the capsulated strains have a greater tendency to spread in a community.

5. The capsulated strains are much more likely to give rise to familial infections than the non-capsulated strains.

6. In some of the cases studied in 1936 a second swab was taken after twenty-four days in the hospital. In more than half the cases there was evidence of reinfection with another type. In other words, cross-infection was the rule rather than the exception. This confirmed similar work in English hospitals.

Acknowledgement.

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OBSERVATIONS ON THE EPIDEMIOLOGY OF STREPTOCOCCAL INFECTIONS.

By E. V. KEOGH,

Commonwealth Serum Laboratories, Melbourne,

AND

HELEN KELSEY,

Queen's Memorial Infectious Diseases Hospital,
Fairfield, Melbourne.

Introduction.

DURING the last few years our knowledge of the streptococcal diseases has been greatly extended. The advance is due mainly to the pioneer work of

Griffith on the serological classification of the hemolytic streptococci. Griffith, overcoming many technical difficulties, developed a slide agglutination method, by which he has distinguished some twenty-five serological types of streptococci associated with scarlet fever, tonsillitis, sore throat and allied human infections. This large number of types may appear at first sight to introduce further complications. In actual fact, the method in the hands of Griffith and his colleagues at the laboratories of the Ministry of Health in England has elucidated the clinical conceptions both of scarlet fever and associated diseases and of their epidemiology.

Glover and Griffith⁽¹⁾ showed that faucial infection with the same streptococcus could give rise in different individuals, either to the syndrome of classical scarlatina, or to follicular tonsillitis, or to "septic sore throat", or to a subclinical infection. In a given area, endemic and epidemic cases of scarlet fever are not all due to the same strain of streptococcus, but several serological types are usually involved. It follows, therefore, that cross infection is a possibility if patients with scarlet fever are concentrated in large wards in fever hospitals. Gunn and Griffith⁽²⁾ showed that frequently there was a change of type in the streptococcus isolated from the throat during the course of scarlet fever, and that this change of type was to be regarded as a reinfection. Allison and Brown⁽³⁾ believe that a majority of complications occurring during the third week in hospital, and subsequently, are due to such reinfection.

In view of these findings, which indicate the desirability of segregation of patients with scarlet fever in groups corresponding to the serological type of streptococcus responsible for the initial infection, Dr. F. V. Scholes, superintendent of the Queen's Memorial Infectious Diseases Hospital, asked Dr. F. G. Morgan, director of the Commonwealth Serum Laboratories, for supplies of suitable type sera, as steps had already been taken at these laboratories towards the preparation of such sera. The sera were first tested for potency and specificity on strains of streptococci freshly isolated from swabs from patients with scarlatina admitted to the Queen's Memorial Infectious Diseases Hospital. When satisfactory progress had been made, typing was continued in the hospital laboratory. We commenced typing in April, 1938; and as we have now typed some two hundred scarlatinal strains, we think it desirable to place the results on record.

Methods.

The technique of the slide agglutination test is described by White *et alii*.⁽⁴⁾

The sera used were prepared in rabbits, the scheme of immunization of Paull and Coburn⁽⁵⁾ being used except in a few instances. All sera were absorbed with group A polysaccharide, prepared by the method of Fuller,⁽⁶⁾ and subsequently, when necessary, with such heterologous strains as gave confusing cross-reactions.

We are greatly indebted to Dr. F. Griffith for provision of the type cultures and for samples of unabsorbed type sera.

Like Pauli and Coburn,⁽⁵⁾ we cannot distinguish between types 17 and 23. Type "Wade" is a type identified by White *et alii*⁽⁴⁾ (*loco citato*). These "Wade" strains are closely related to the Griffith type culture IX. By careful absorption of sera prepared with the Griffith type strain and with a local strain, it is possible to distinguish the two types. We are not fully convinced that the distinction is sufficiently pronounced to justify the creation of a new type, for the Griffith type IX culture may have lost a minor antigenic component subsequent to isolation. However, since these "Wade" strains are common in New South Wales, Victoria and South Australia, we have provisionally accepted the nomenclature of White *et alii*, so that the epidemiological picture in Australia may not be obscured by the use of different names by different workers for the same endemic strains. It is intended to refer these strains to Dr. F. Griffith for his opinion as to their correct classification.

Type "Stewart" is also related to type "Wade", but is readily distinguished from it both by absorption and by cultural tests.

The greater part of the laborious work of preparation and absorption of these sera was carried out by Mr. R. T. Simmons, of the Commonwealth Serum Laboratories staff, who assisted us also in the primary isolations.

Results.

The findings are summarized in Table I. It will be seen that during the period under review types II and XVII dominate the picture, with type "Wade" a bad third. These three types are together responsible for 80% of the cases examined. We wish to make it clear that swabs were not examined from every patient with scarlet fever admitted to hospital. As our experience grew, we were able to cope with an increasing number of strains each week. No selection of cases was made. We have examined swabs of the majority of scarlet fever patients admitted from Monday to Thursday of each week, and altogether have dealt with approximately one-third of the patients admitted with the diagnosis of scarlet fever. Since there was no selection of cases the results should be a fair random sample and give an accurate picture of the essential facts. However, since the percentage of cases examined in successive months varied, only the total figures for the whole period will be discussed.

The main types encountered were II and XVII. Type II is a common cause of scarlet fever in England, but has not been found in New South Wales (Ward, personal communication). Type XVII has been found outside Victoria, in New South Wales by White *et alii*,⁽⁴⁾ and in Queensland by us, and is evidently widely distributed. Through

TABLE I.

The Serological Types of Streptococci Involved in Epidemic and Endemic Scarlet Fever: Comparison with other Strains.

| Serological Type. | Scarlet Fever, 198 strains. | Scarlet Fever (Ballarat), 12 strains. | Surgical Cases, 21 strains. | Puerperal and Post-Abortional Cases, 26 strains. | Throats of 218 Healthy Persons, 14 strains. |
|-------------------|-----------------------------|---------------------------------------|-----------------------------|--|---|
| II | 88 | 8 | | | |
| IV | 2 | | | | 1 |
| VI | 3 | | 2 | | |
| "Wade" | 19 | 3 | | | 1 |
| X | 5 | 1 | 3 | 2 | |
| XI | 6 | | 1 | | 2 |
| XII | | | 1 | | |
| XVII | 64 | | | | 1 |
| XIX | 4 | | | | |
| XXII | | | | 16 | |
| XXV | 1 | | | | |
| XXVII | | | 2 | | |
| XXVIII | 1 | | 1 | 1 | 3 |
| "Stewart" | | | 2 | 4 | 1 |
| Untyped.. | 5 | | 9 | 3 | 5 |

the courtesy of Dr. P. G. Smith, superintendent of the Ballarat and District Base Hospital, we were able to examine swabs from a number of patients with scarlet fever, of which there was a small epidemic in Ballarat during the winter. Of the streptococci isolated, eight belonged to type II, three to type "Wade" and one to type X. These patients were in contact, and therefore the results do not necessarily indicate the types responsible for the initial infection. It is interesting to note, however, that type II was dominant, while type XVII was absent.

We have some evidence that the predominant strains were also the most virulent. Three cases of reinfection with type II, with the clinical picture of a second attack of scarlet fever, were encountered. In one case the original infecting strain belonged to type VI; in the other two cases the type of the original strains could not be identified, that is, they did not belong to the Griffith series.

There was no significant difference in the age distribution of cases due to the different types. In all types most of the patients were aged from five to eleven years.

The other indication of the relative virulence of different strains was gained from the clinical condition of the patient on admission to hospital. Since swabs were not examined throughout the illness, a lengthy stay in hospital or the presence of complications cannot be debited to the original infecting type. Cross-infection with other strains may have been responsible for one or the other condition. The best evidence of the patient's condition on admission is gained from the record of whether or not scarlatinal antitoxin was administered. Since the serum is expensive, it is given only to the more toxæmic patients. Of 88 patients with a type II infection, 30 (34.1%) received serum; of 64 patients with a type XVII infection, 25 (39.1%) received serum; while of the 46 patients infected with other types, 10 (21.7%) received serum. These figures suggest that the dominant types were more toxigenic; and if the findings for the two main epidemic types are combined (36.2%) and compared with those of the remaining types (21.7%), the difference verges on the statistically significant.

During the same period we have typed such streptococci derived from septic or other cases in the metropolitan hospitals as were available. Not a single representative of the three dominant scarlatinal strains was encountered. In fact, about half of these non-scarlatinal strains could not be typed; that is, they did not fall into the group differentiated by Griffith, who dealt largely with scarlatinal cocci. The numbers examined are small, but the results are striking. These strains were all derived from septic foci in various sites. Of these twenty-one strains, nine could not be typed. This is in distinct contrast to the scarlatinal strains, of which 96% were typed. Details of the types found in this group are shown in Table I.

In view of these findings we were led to examine (a) strains from patients with puerperal and post-abortion infections, isolated, chiefly from vaginal swabs, during the same period, by Miss Hildred Butler, who kindly allowed us to type these strains, and (b) strains isolated from the throats of apparently healthy adults and children.

The results of examination of the puerperal streptococci over the period from April to September, 1938, are shown in Table I. It will be seen that again the scarlatinal strains II, XVII and "Wade" are not encountered. The majority of the strains (16 of 26) belonged to type XXII. The high incidence of type XXII infections at the Women's Hospital over this period was associated with either an outbreak of mild "sore throat" among the staff, due to the same organism, or with a carrier or carriers of this type among the nursing

staff. Further bacteriological investigations of the origin of these puerperal infections are being conducted by Miss Hildred Butler and Miss M. Phillips.

We did not examine swabs from the throats of healthy persons over the whole of this period; but near the conclusion of the work, when patients with scarlet fever due to types II, XVII and "Wade" were still being admitted to the hospital at Fairfield, we took swabs from 218 such throats, mainly of healthy adults. Altogether 55 β -haemolytic streptococci were isolated, of which 14 belonged to group A (Lancefield). The results of the typing are shown in Table I. From only one of these throats was an epidemic type isolated—a type XVII strain from the throat of one of us, who had been infected with this strain two months previously, with the typical symptoms of septic sore throat. On only five other occasions did we isolate the dominant scarlatinal types from other than frank cases of scarlet fever: from four patients with sore throat (type XVII, 2; type II, 2) and from one patient with acute rheumatic fever (type XVII).

Discussion.

In this small series the streptococcal types responsible for the majority of cases of scarlet fever were not encountered in streptococci isolated from patients with surgical streptococcal infections (patients with infection of the ear or nose were not examined); from patients with puerperal and post-abortion infections; or from carriers of streptococci during the same period. These findings were unanticipated. However, Griffith,⁽⁷⁾ whose experience in this field is unrivalled, has recently made the following statement in connexion with the streptococci involved in school epidemics:

As the serological classification of the *Streptococcus pyogenes* is by no means complete, it is of some significance from the epidemiological standpoint that it has been possible to identify the type of so many of the strains which have caused outbreaks of epidemic proportions. Such readily identified types appear to have a special capacity to spread by droplet infection; others, of which there are a great variety, seem not to possess this capacity and only come to light in sporadic throat infections and in contact infections of wounds.

Even in the light of this statement, the epidemic scarlatinal types might have been expected to occur among the streptococci isolated from the throats of the normal population, or from infections commonly due to droplet infection, such as the puerperal group. Topley and Wilson,⁽⁸⁾ for example, after having collated the existing evidence, consider that the epidemiology of scarlet fever is closely analogous to that of diphtheria, in that in both diseases carriers greatly outnumber the clinical cases. Although our samples are necessarily small, and although we have examined the throats of very

few children and of no known contacts, we are not inclined to discount the results too heavily for that reason. As a tentative explanation we suggest that a broad distinction should be made between the manner of spread of endemic and epidemic scarlet fever. In endemic scarlet fever, the carrier rate is high (perhaps 5% to 10% of the population) in proportion to the case rate. It is assumed that the individual carrier of an endemic strain is an unlikely originating focus of other than isolated cases of scarlet fever, perhaps because the endemic strains are of low infectivity or toxigenicity, perhaps because they are not present, or only intermittently, in large numbers in the throat of the average carrier, or perhaps because such carriers are relics of previous epidemics of such types to which the community at large has a consequential substantial immunity. In epidemic scarlet fever the proportion of manifest to latent or subclinical cases may be high. If an epidemic strain gains access to a throat, it is assumed that either it implants itself, producing symptoms, often of scarlet fever, or fails to become established. The individual, usually a child, with manifest symptoms, is an unlikely risk to midwifery or surgical patients in hospital. As the endemic strains are those commonly present in the throats of the healthy adult population, they are also commonly found in puerperal and surgical infections, where conditions at the site of infection favour survival and multiplication of small chance implantations.

The progress of this work has convinced us that the typing of streptococci by the Griffith technique is a practical proposition in the fever hospital laboratory. The apparently bewildering multiplicity of types is not the obstacle it might appear at first sight. In epidemic times, when the pressure is heaviest on the laboratory worker responsible for the typing, a few types are responsible for the great majority of cases. It is then unnecessary to test a given strain with the whole battery of sera; the common types will be eliminated first. Conversely, in non-epidemic periods the number of scarlatinal admissions is small, and more time can be spared for type identification. From the bacteriologist's standpoint, therefore, segregation of scarlatinal patients according to type is as practicable as is separation of diphtheritic from scarlatinal patients. The difficulties involved are chiefly administrative, and these we are incompetent to discuss. Dr. F. V. Scholes allows us to state that in his opinion the local problem should be attacked by: (a) individual isolation of all patients on admission to hospital, either in cubicles or by barrier nursing in small wards until the infecting organism is typed; (b) segregation of patients according to type in small wards of suitable size; (c) when the walking convalescent stage is reached, segregation according to type in separate convalescent wards and playing areas. It is hoped that complications will be minimized by the introduction of these methods, and that it will be possible to discharge many

children about three weeks after admission to hospital.

It seems unreasonable to ask the bacteriological laboratories of the general hospitals to undertake streptococcal typing as part of their routine duties. Many of the strains we have so far encountered from such sources do not belong to the type series. In any case, there is little of clinical significance to be gained. Isolation of a streptococcus in pure culture from a septic focus is sufficient evidence of its pathogenicity for that patient. Determination of group or type will not help the clinician in therapy or prognosis, except in so far as group A strains are to be considered more virulent for man. On the other hand, it is highly desirable to extend our knowledge of the distribution of the streptococcal types prevalent in Australia, and all strains isolated should therefore be examined. Such typing is probably best undertaken at a central laboratory where workers experienced in the pitfalls and difficulties of the technique are available. The same considerations apply to the identification of the source of infection in outbreaks of puerperal sepsis.

Summary.

1. One hundred and ninety-eight strains of streptococci isolated from patients with scarlet fever in Melbourne from April to September, 1938, have been typed by the Griffith slide agglutination technique.

2. The predominant types encountered were II and XVII and, to a lesser extent, "Wade".

3. These types were not encountered in a series of streptococci isolated during the same period from cases of surgical streptococcal infections in general hospitals, from patients with puerperal and post-abortion infections, and from throats of healthy adults and children.

4. The significance of these findings is discussed.

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THE OCCURRENCE OF *HYMENOLEPIS DIMINUTA*
(RUDOLPHI, 1819) AND *DIPYLIDIUM CANINUM*
(LINNÆUS, 1758) AS PARASITES OF
MAN IN AUSTRALIA.

By A. J. BEARUP, B.Sc.,

School of Public Health and Tropical Medicine,
University of Sydney,

AND

E. L. MORGAN, M.B., Ch.M.,

Microbiological Laboratory, Department of Public
Health of New South Wales, Sydney.

TAPEWORMS in man are not common in Australia. The tiny *Hymenolepis nana* has been most often found; it occurred in 0.2%, and the large tæniæ (*Tania saginata* and *Tania solium*) in 0.02% of 202,582 persons examined by the staff of the Hookworm Campaign in the years from 1919 to 1924.⁽¹⁾ The number of persons examined and the percentage incidence of *Hymenolepis nana* and *Tania* species for each State and Territory of the Commonwealth are shown in Table I.

TABLE I.
Percentage Incidence of Tapeworms.

| State. | Number of Persons Examined. | Percentage Incidence of Tapeworms. | |
|--------------------------|-----------------------------------|---------------------------------------|--|
| | | <i>Hymenolepis nana</i> . | <i>Tania saginata</i> and <i>Tania solium</i> . |
| Queensland | 167,290 | 0.2 | 0.02 |
| New South Wales | 23,573 | 0.2 | 0.04 |
| Victoria | 2,497 | 0.06 | 0 |
| Tasmania | 2,209 | 0 | 0 |
| South Australia | 3,381 | 0.06 | 0.1 |
| Western Australia | 2,846 | 1.5 | 0 |
| Northern Territory | 886 | 0 | 0 |
| Papua | 17,905 | 0.02 | 0 |
| New Guinea | 28,234 | 0.4 | 0 |

The incidence of *Tania saginata* in Victoria and many other important facts about this parasite have recently been described in a series of papers by the staff of the Baker Institute of Medical Research, Melbourne. The offer of a bonus brought ninety cases to their notice; forty-two subjects were Syrians who had acquired their infestation overseas. No case of *Tania solium* was encountered.⁽²⁾

Tania solium is apparently extremely rare in Australia, and is absent from New Guinea and Papuan natives. It is fortunate that *Tania solium* (and *Trichinella spiralis*) are apparently not present in these territories, as the pig, through which they are disseminated, figures so largely in the diet of their native populations. We do not know of any definite record of *Cysticercus cellulosæ* in the pig in Australia; it is possible that all victims of *Tania solium* in this country have acquired their parasites elsewhere. In the collection of the School of Public Health and Tropical Medicine there is one specimen, identified by P. A. Maplestone, and obtained from a Scottish woman who had arrived in Australia ten months previously. Many of the cases collected by Johnston⁽³⁾⁽⁴⁾ are regarded by him as doubtful;

the parasites were possibly *Tania saginata* or other tapeworms. The six cases recorded by Sweet⁽¹⁾ were found during an investigation of South Australian⁽⁵⁾ and Broken Hill miners⁽⁶⁾ and were distributed as follow: Wallaroo and Kadina mines, 1; Wallaroo, 1; Port Pirie, 2; Broken Hill, 2. The four cases from South Australia were "determined by the presence of segments of the worm in the faecal specimen examined", and the Broken Hill cases "were identified as *T. solium*, the pork tapeworm, by the recovery of the entire worms after treatment with oil of chenopodium. The worms measured 22 feet and 18 feet in length. One of these was from a miner and the other from a resident of Broken Hill." No other statement is made of the reason for these determinations; examinations of the heads of the entire specimens for hooklets would have given definite evidence of their identity.

The fish tapeworm, *Dibothriocephalus latus*, is extremely rare in Australia, but has been noticed in foreigners who probably brought it with them.

In addition to the species mentioned above, of which man is a normal host, there are species parasitic in lower animals which may infest man if he gets in the way of their cycle of development. Some of the means by which he may do so are pointed out in the text of this article. Cases of this type are sporadic, and usually but few parasites are present; they are not often diagnosed, except in the laboratory.

Hymenolepis Diminuta.

Cases of the occurrence in man of the rat tapeworm, *Hymenolepis diminuta*, are rare enough to merit record. Riley and Shannon,⁽⁷⁾ in 1922, recorded 61 cases from various parts of the world. Since then this number has been approximately doubled, mainly as a result of the extensive surveys for intestinal parasites by public health organizations. From 1919 to 1928 officers of the Hookworm Campaign in Australia⁽⁸⁾ reported nine cases that occurred in Queensland and northern New South Wales, where the greatest number of examinations were made. About 300,000 specimens from all States of the Commonwealth were examined, but probably more than one-quarter of these represented reexaminations. Five of these cases are included in the figures given by Sweet⁽¹⁾ covering the period from 1919 to 1924.

According to Johnston,⁽⁴⁾ the first record of a case in man in New South Wales (and Australia) is that of Badham.⁽⁹⁾ Another case was found in a survey of the Newcastle district by the staff of the Hookworm Campaign in 1920. Together with the three cases reported below, five cases have been reported in New South Wales.

In Queensland, Johnston⁽⁴⁾ has noted one extra case, making a total of ten for that State, and of fifteen for Australia.

CASE I.—On July 2, 1935, tapeworm segments were passed by an infant living in a suburb of Sydney. These were stained and found to be ripe segments of *Hymenolepis diminuta*.

CASE II.—On July 29, 1935, specimens of faeces containing eggs of *Hymenolepis diminuta* and tapeworm segments from a child living in a Sydney suburb were examined. The segments were gravid, and the sexual organs had almost completely degenerated; but eggs of *Hymenolepis diminuta* were present in the uteri.

CASE III.—On June 15, 1938, threads supposed to be "worms" passed by a child, aged five years, were submitted for examination. The mother stated that the child had been passing these objects for some time. Portions of at least three specimens of *Hymenolepis diminuta* were present, including one head. Stained segments and the head had the characters of this worm.

Hymenolepis diminuta, as a parasite of rats and mice, is probably as widespread as are the hosts. In Sydney, Johnston⁽¹⁰⁾ found an incidence of 10% in the black rat (*Mus rattus*) and its variety *alexandrinus*, of 14% in the brown rat (*Mus norvegicus*), and of less than 2% in mice. Fielding⁽¹¹⁾ found 15% of Townsville rats to be infested, and also reported the occurrence of this parasite in the water rat (*Hydromys chrysogaster*). The worm requires an intermediate host for the development of its larva; and this may occur in a wide range of insects, for instance, larvae and adults of species which infest foodstuffs.

Joyeux⁽¹²⁾ believes the most important of these to be the adult meal-worm, which is a beetle (*Tenebrio molitor*), and the larvae of the rat fleas (*Ceratophyllus fasciatus* and *Xenopsylla cheopis*). Chandler⁽¹³⁾ thinks that the use of foods, such as biscuits, dried fruits and potato chips, and pre-cooked breakfast cereals, is the common cause of infestations, rather than ingestion of flea larvae.

Children furnish the majority of cases; the infestations are usually light, and no symptoms can be definitely attributed to the presence of the parasite. Cases are discovered by the finding of portions of the strobilus in the stool, or by the finding of the eggs in the course of routine examination of the faeces for the presence of parasites.

Sometimes nausea and epigastric pain have been reported, and in infants mild nervous and intestinal disorders.

Recently Seitenok and Kolosov⁽¹⁴⁾ reported a case in Soviet Russia, in which the removal of a single worm coincided with a rapid subsidence of symptoms of severe vertigo, continual nausea, frequent vomiting and rheumatic pains in the limbs. Luney⁽¹⁵⁾ however, recovered forty worms from a child, aged nineteen months; the only symptoms noted were that the child was somewhat fretful.

With regard to treatment, Chandler states that: "*H. diminuta*, which may be regarded as an abnormal or accidental human parasite, is very easily expelled by anthelmintics or even by cathartics and probably is often evacuated spontaneously."

Dipylidium Caninum.

Dipylidium caninum, normally a parasite of dogs and cats, also occurs very rarely in man. Many species of carnivora, including the dingo, may harbour the adult worm; in Australia cats and dogs are very commonly infested.

Blanchard⁽¹⁶⁾ has reviewed sixty human cases, reported up to 1907. In 1914⁽¹⁷⁾ he brought the total to seventy-six; seventy-two were in Europe, two in the United States of America, and one each in Cape Colony and Venezuela. Since that time the distribution has been extended to Portugal,⁽¹⁸⁾ Porto Rico,⁽¹⁹⁾ Cuba,⁽²⁰⁾ Brazil,⁽²¹⁾ Uruguay⁽²²⁾ and the Philippine Islands,⁽²³⁾ while further cases have been found in Italy,⁽²⁴⁾ England⁽²⁵⁾ and the United States of America.^{(26) (27)} Including the cases mentioned in this paper, which are the first recorded from Australia, over ninety cases have now been diagnosed.

The two cases described below were diagnosed from examinations of mature and gravid segments; in neither case was the scolex present.

CASE I.—A specimen consisting of *Dipylidium caninum* segments, collected from an infant, aged six months, in 1928, is in the museum of the School of Public Health and Tropical Medicine, Sydney. This child was a resident of North Queensland, but no other particulars are recorded.

CASE II.—On April 26, 1938, several tapeworm segments, found in the stool of a female child, aged fourteen months, were brought in by Dr. Reye, of the Royal Alexandra Hospital for Children, Sydney. Similar segments had previously been noticed by the parents in the faeces of the child and of greyhound dogs kept by them.

The blood count on admission was as follows: the erythrocytes numbered 3,700,000 per cubic millimetre; the cells were normocytic; the haemoglobin value was 10.9 grammes per 100 cubic centimetres of blood; the leucocytes numbered 8,700 per cubic millimetre in the following percentages: eosinophile cells, 12; neutrophile cells, 52; lymphocytes, 34; monocytes, 2.

After treatment with *Aliz-mas* two worms were passed, complete except for the heads, which were not found. Since that time no further segments have been voided; the foster-mother states that the child has lost the restlessness and fits of screaming which accompanied the parasitism.

Nearly all subjects of this parasite have been children. In Blanchard's series, 30% were under six months and 85% under eight years of age. The youngest child was five weeks old. The incidence in adults may possibly be greater than these results would lead us to believe, as the stools of young children are subjected to a regular examination by careful mothers. The infections are generally discovered by parents, who notice in the stool ivory-coloured objects of the general size and shape of cucumber seeds. These are the gravid segments of the worm; they have a limited power of movement, and are thus made more conspicuous. Compared with the gravid segments of the human species of *Tenia* they are narrower, show a more distinct convexity of the lateral borders, and have not one, but two sets of genitalia, each opening into a genital pore in the middle of the lateral border. These may be seen if the segment is lightly compressed between two glass slides and viewed by transmitted light.

Eggs of *Dipylidium* are seldom seen free in faeces; they are contained in nest-like cavities of the uterus, each such cavity including from five to twenty eggs, which are not freed until the segment becomes disintegrated or broken.

Infections are spread by insects, of which the dog flea (*Ctenocephalus canis*), the human flea

(*Pulex irritans*), and the dog louse (*Trichodectes canis*) are proven carriers. It is by the accidental ingestion of these intermediate hosts containing the larval stage of the parasite that man is infected. Only the adult fleas are infective; the tapeworm eggs are eaten by the flea larvæ, but the embryo does not develop to the cysticercoid stage until after the metamorphosis to the adult (Joyeux⁽¹²⁾).

The greater incidence of these parasites in children than in adults may result from their closer association with household pets. They are also less likely to be critical in their examination of food which might be contaminated with small ectoparasites from these animals. Blanchard points out other possibilities, in that pets often lick the faces of children or their eating and drinking vessels. The tongue of the animal picks up the infected insects from its coat, and it is by swallowing them that its own infestation is brought about.

Symptoms of *Dipylidium caninum* infestation are apparently absent, or slight, or consist only of vague intestinal disturbances or increased irritability. The presence of one or very few worms is the rule in infestation of human subjects. In dogs the infestations are often very heavy, and may then cause nervous and digestive troubles, emaciation and weakness. The passage of a segment or string of segments through the anus often causes itching and irritation, manifested by the animal's sitting down and dragging itself forward on its haunches.

Brandt (cited by Blanchard⁽¹⁶⁾) has reported two cases of heavy infestations with 48 and 30 worms.

The second subject was a child, aged eight years, previously in good health, who showed symptoms of excitability, difficult respiration, epigastric pain, loss of appetite, and constipation. About a month after the onset of these symptoms she expelled some worms spontaneously and recovered. Similar cycles of symptoms, expulsion of worms and recovery, continued for two months, the expulsion of worms being accompanied by pruritus and a sensation of burning at the anus. After treatment with extract of male fern she expelled thirty worms and recovered. The child played constantly with a dog, which was also allowed to sleep on her bed. *Trichodectes* were present on the dog; they had also passed onto the child and were found in her hair.

Summary.

1. Three additional cases of human infestation with *Hymenolepis diminuta* in Australia are recorded.

2. Two human cases of infestation with *Dipylidium caninum* are reported. They are believed to be the first from this continent.

3. The references to the occurrence of *Dipylidium caninum* in man have been brought up to date, so far as is possible.

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GROUP PRACTICE.

By L. J. JARVIS NYE,
Brisbane.

CHARLES DICKENS once wrote: "It is well for a man to respect his own vocation whatever it is and to think himself bound to uphold it and to claim for it the respect it deserves." Since I am an advocate for group practice, I trust that in the discussion of this interesting problem my remarks will not be judged on Dickensian motives.

The merits and demerits of individual and group practice must be discussed frankly and dispassionately. It is not my purpose to deal with the extraordinary individualist practitioner or the extraordinary group practice, but rather with systems well fitted to the needs of the community, and with the essential rules that must govern any incursion into group medicine, if it is to succeed in the best interests of both patient and doctor. This paper, based on the experience of eight years of group practice, seeks neither to proselytize nor to condemn. Its aim is merely to state certain conclusions which may be of value to those interested in medical reform.

In order to provide the most efficient and economic service, industry has for many years past found it necessary to organize specialized knowledge and services into coordinated units. It is not unreasonable to state that the science of medicine has progressed as rapidly as industry; yet, apart from public hospitals, little real attempt has been made to organize and coordinate knowledge and equipment in medical practice. During the past twenty years the progress of the science of medicine has been so remarkable that it would be quite impossible for one individual to keep himself well informed on new knowledge in all fields of medical endeavour if he devoted the whole of his energies purely to reading. It is therefore obvious that one practitioner cannot be expected to treat expertly the majority of ailments. Under the system of individual practice there must inevitably be an appalling lag between the discovery of new knowledge and its expert application for the benefit of the patient.

Although as a profession we are subject to much criticism, there is little doubt that most practitioners are very conscientious in their work and are imbued with a sense of personal responsibility to the public; yet the scope of new knowledge is so wide, and the time for close study so limited, that it is frequently admitted that the best a busy practitioner can do in an effort to keep up to date is to follow the recommendations of the travelling salesmen of various commercial drug houses. We are all more or less guilty of this practice, and many instances can be quoted in which the resulting gain to the drug houses has been a disservice to the public. The treatment of duodenal ulcer by histidine injections can be cited as an excellent example. Founded on the flimsiest of theories, the propa-

ganda of certain trade organizations swept through the world. Although we all know that duodenal ulcer is a chronic disease, which occurs in certain types of stomachs and recurs in cycles, the idea of a rapid and remunerative cure was immediately accepted with enthusiasm by medical practitioners, many of whom are still using it today in spite of the irrational premises on which the treatment is founded and in spite of the critical comments of leading medical periodicals. Another good example is the extensive use of expensive liver preparations, which, except for their vitamin B content, are of specific value only in the comparatively rare cases of megaloblastic anaemia. The same lack of critical thinking or reading is shown in the use of millions of costly ovarian and other gland tablets, which have been prescribed in spite of well-established laboratory disillusionment. We are also drifting into a new vogue for the wholesale and irrational use of injections of the newer synthesized products of the reproductive glands, the effective use of which is limited to specialized problems.

All this neglect in keeping well informed on the part of practitioners is responsible for disappointment and unnecessary expense to the patient, as well as for loss of faith in the medical profession. The way is thereby left open to the unqualified practitioner, who, by paying more attention to the personality, often succeeds in helping where we have failed. Whilst group practice will not necessarily remove such anomalies, it tends towards this end by reason of the critical scepticism engendered by the divergent viewpoints of men meeting and discussing their patients as a daily procedure.

Besides specialized knowledge, the medical practitioner requires diagnostic and therapeutic facilities, equipment and instruments, the cost of which is prohibitive to the individual practitioner. Furthermore, if they could be afforded, he could rarely expect to obtain sufficient practice to use them expertly and expeditiously. In some cases, indeed, the inexpert use of certain instruments and equipment has proved disadvantageous to the patient. In our pride in being considered up to date, most of us have been guilty of purchasing special instruments for carrying out certain types of work which, if we considered sufficiently the welfare of the patient, should have been performed only by the specialist, who has the advantage of much greater experience in dealing with such problems.

Another undesirable aspect of individual general practice which we have all observed is that the doctor with a good, persuasive bedside manner exerts an unreasonable amount of influence on the patient, who is not in a position to judge the scientific ability of the man he has chosen to take care of his complaint. Most people choose their doctor purely on the grounds that he has a large practice, or because Mr. or Mrs. So-and-So gives him a good name. As is frequently observed, the result is that many "nice", incompetent doctors have large and lucrative practices, while quite a number of highly scientific practitioners spend most of their

time doing honorary work at public institutions. If we are what we claim to be, an organized and disciplined profession, should we not devote more energy towards safeguarding the welfare of the unfortunate patient rather than protecting the goodwill of the incompetent doctor?

In order to bring about this desirable reform, it would appear that the ideal plan both for doctor and patient is that medical practice should be organized into units, so that the discoveries of research workers can be immediately and effectively translated into active practice in the best interests of the patient. This is true even if the patient can afford to pay specialists' fees; for, by working singly, the specialist tends to have too narrow an outlook on a problem, and often endeavours (though with no dishonest motive) to keep the patient in his own hands. By working in a team and by discussion with other members, a better balanced judgement of local signs and symptoms is developed.

In the past all improvements in medical service have been introduced and carried out by the medical profession; but, whether on account of delinquency, or perhaps desire to retain the financial privileges of the *status quo*, there exist amongst many of our members definite opposition to change and satisfaction in the belief that the existing system of practice is good enough or will gradually evolve into something better. On the other hand, the public is very conscious that the existing system is far from satisfactory, since the purely general practitioner service is inefficient and the specialist service too costly. The people are in consequence forcing the reform from other quarters, and we are losing our legitimate prerogative of self-organization. The undeniable trend towards increased general hospital attendances must be viewed to a certain extent as a failure on our part to provide the necessary service at a non-prohibitive cost. It must be admitted that there can be both good and evil in the grouping of practitioners and in the assembling of expensive equipment. These are mere factors; but whether the change is to be for good or evil depends entirely on the method of their use and on the outlook of the individuals constituting the group. Ethical principles are personal and individual, but it is obvious that the standards of conduct for individuals working in a group should be higher than for those working as individuals. In actual practice, in such a group of honest practitioners, where members are cognizant of one another's work, either from discussion or from the records, each is the judge of the other, and any other motive than the welfare of the patient becomes almost impossible.

In the United States of America after the War many group practices were rapidly formed. This was probably due to the benefits of organized teamwork noted during the War, and also to the fame of the Mayo Clinic and to the belief that similar success could be achieved by any other group of practitioners. To many the idea promised an easy

method of getting rich quickly, but all group practices founded for profit and pure commercialization have been not only medical but also social and financial failures. When the ethics of practitioners are loose enough to allow of a dishonest deal to the patient, there is usually a similar lack of honesty among the associates. Any suspicion of this results in disharmony, which eventually leads to dissolution of the team. It must be remembered, too, that professional skill and prestige are probably not the most essential qualities for harmonious cooperation in a group; but, above all else, are needed a high sense of duty and honesty of purpose.

Unquestionably many medical men are more suited for and prefer ruthless individuality. For them the group system holds no attraction, since it is essential that each member must conform to the rules which govern all efficient team work. The spirit of the good of the whole must transcend that of the good of any particular individual. Internal dissension is always possible where members are too self-interested and jealous to work in the spirit of true cooperation. Such disharmony must be obviated by a wise selection of men within the group. There is no place for the "go-getter" or self-seeker if the clinic is to function harmoniously. It is also imperative that members meet together almost daily for frank and critical discussions on the work of the group, which must have for the first consideration the welfare of the patient. Besides being necessary in dealing with associates, the same harmonious cooperation is necessary in dealing with patients and their problems; for it is obvious that a group shares not only the success and friends of an individual member, but also his failures and enemies.

Not only must there be mutual harmony amongst the medical associates, but also the same spirit must prevail amongst the lay members. Each must be encouraged to feel that he or she is an important part of the group, and that in all relations with the patient kindly and efficient service is almost equally important on their part as it is on the part of the doctors.

A criticism which has been levelled at group practice is that patients are treated on a mass-production scale. If there were any truth in this assertion that, under the clinic system, man is treated as a standardized organism, then such a type of practice would certainly be doomed to failure. Each patient must be considered as an individual personality, in whose physical and mental make-up environment plays too important a part to be neglected. In the old order of medicine the doctor sat back in smug satisfaction after handing a prescription written in unintelligible Latin to the completely mystified patient; but in the new order the doctor must become the teacher, and he must discuss with the patient the nature of the symptoms and signs in an endeavour to get him to understand both the cause and the treatment of the complaint. In effect the doctor should live up to his

title, which, as you know, is derived from the Latin *docere*, to teach. He should teach the patient how to keep well. For this reason expert transference is essential, and our experience has convinced us that a general practitioner with a good transference retains his powers of successful transference when practising as a specialist in a group. In a successful group also the patient feels an added sense of security and satisfaction by the knowledge that his health, which is his great concern, is the subject of careful investigation by more than one practitioner if necessary. In other words, he retains his transference to the doctor in charge of his case, but there is an added transference to the group itself.

The Cost of Service.

It has been said that group practice increases the cost of medical service. This is certainly true in the case of some clinics, where the patient is subjected to a large number of routine laboratory tests and mechanical examinations, in the belief that they not only simplify the diagnosis but also impress the patient. In this type of "test-tube" diagnosis a decision as to the nature of the complaint is often made from the reports, even if they do not fit in with the clinical picture. It is impossible to make a diagnosis by factory methods, and the errors resulting from such a system not only increase the sufferings of the patient but add greatly to the cost of the service. Where a staff has reasonable consideration and uses ancillary aids to diagnosis, such as radiological, pathological and biochemical examinations, only when the clinical history and examination indicate their need and when the necessary information is not otherwise available, the cost must be considered a necessary part of correct diagnosis. Therefore, although it is true that the immediate service may be more costly than the general practitioner service, it is certainly not true if considered from the economic viewpoint of ultimate cost.

With reasonable judgement there is no doubt that an efficient group service gives better results in correct diagnosis and in the early application of correct therapeutic measures which will save much time and expense to the sufferer. In no field of medicine is this more true than in the specialist's services. All specialists can cite innumerable cases in which incorrect treatment by highly intelligent and conscientious general practitioners has had unfortunate and sometimes tragic consequences for the patient. The physician will tell of such diseases as subacute combined degeneration, phthisis *et cetera*, which have remained undiagnosed until irreparable damage has been done, or of patients with functional heart murmurs who have been rendered hopelessly neurotic by being treated as suffering from organic disorders *et cetera*. The psychiatrist is constantly bewailing the years of neglected opportunities for correction of psychological traumata, and the inadequate treatment of acute manias which so often result in death or permanent insanity. The surgeon is righteous in his

indignation when he surveys the neurotic possessor of a much mutilated abdomen or hands ruined by the inopportune and unskillful use of the scalpel. The throat specialist finds difficulty in concealing the truth when dissecting out tonsils which have "grown again" after one or more previous removals.

The skilled, conscientious general practitioner makes all these mistakes, because he is not sufficiently conscious of his own incompetence to deal with special problems, and because it is economically inexpedient for him to pass on to a specialist every patient who is suffering from a disorder the expert treatment of which requires specialized knowledge and equipment. Far from condemning the general practitioners for their unavoidable shortcomings, I am greatly in sympathy with them; for, having been a general practitioner myself, I understand the magnitude of the task with which they are confronted. The great number of complaints they are expected to treat promptly and successfully, their irregular hours and the ever-widening and varied range of reading necessary to equip them for their work, make busy general practice the most difficult, the most fatiguing and the most anxious form of medical practice. In order to carry out his duties successfully, the general practitioner needs intellectual, physical and psychological characteristics far beyond the standard of the average individual. It is obvious that the general practitioner will remain in the best-planned medical services as an important part, probably the most important part, of the unit. By being familiar with the environment of the patient, he will often be in a much better position to treat certain ailments. He will do much of the ordinary work, but will need the assistance of the central group for special problems, which he now treats to the best of his ability, simply because, under the existing system of practice, it is inexpedient and disadvantageous to him to pass the patient on for more expert guidance, even if the patient can afford to pay the extra fees entailed. Under the group system the work will not be so exacting for him and he will naturally make fewer mistakes than when practising as the general practitioner of today.

Remuneration.

Practitioners who contemplate organizing a group clinic in the hope of making more money will eventually, if not immediately, be doomed to disappointment. In a recent review of group practices in the United States of America it was ascertained that the net income distributed to its medical members averaged between 50% and 60% of the total collections, whereas in ordinary general practice the net income of individual practitioners varied, according to the size of the city, from 66% to 73% of the gross income. This saving is largely due to the fact that most general practitioners conduct their practices at their homes, where the overhead expenses, such as upkeep of a consulting room, rent, incidental expenses and some part of transportation charges, are to some extent included in the living

costs of the home and other needs of the practitioner and his family. Also, in a fully and efficiently equipped clinic there are many services available for the patient. These services can be bought only at a price that must obviously add to overhead costs. The benefits derived from team work are not so much in monetary reward as in satisfaction both to the medical man and the patient. When a practice is limited to certain special subjects the specialist can feel much more satisfied with the work done, since he is thoroughly familiar with it in theory and practice. In addition there are many other advantages, such as, the interchange of opinions and frequent consultations with associates, the increased security in that the practice continues in spite of individual sickness or holidays, the greater scope for research, the pooling of literature and the compilation of records.

Establishments.

The United States of America has led the world in group-clinic organizations. In 1933 there were over 300 group clinics in that country. The rate of growth was very fast from 1914 to 1920, but since 1920 it has been slower than the general trend. The extension of laboratory facilities and out-patient departments in hospitals may be playing a part in limiting this growth.

Personnel.

Excluding the Mayo Clinic, which employs something like 400 medical men, the average number of practitioners in group clinics ranges from five to six. A successful group should consist of a minimum of three practitioners, the ideal of this number being a general physician, a general surgeon and an eye, ear, nose and throat specialist. For the formation of such a group it would be desirable for all to have some personal following from which to supplement one another's practice. As the work of the team grows the increase may be in various directions; therefore another practitioner can be added to take over a section from a member who is already working to full capacity. In a properly constituted general clinic it will be obvious that the growth must be largely on the medical side. At the Brisbane Clinic we have four physicians, one general surgeon and one eye, ear, nose and throat specialist. The physicians, while still retaining a general knowledge of internal medicine, have each special subjects in which they expect one another to become expert by practice and by reading. When the case is properly presented we have found little difficulty in referring patients to the man most qualified to take care of their particular complaints. In addition to medical members, a group needs an efficient lay staff. In our group are employed one clinical clerk, three technicians, five secretaries and typists, two account clerks and one telephone and record clerk. Two of the above are trained nurses. Good technicians are essential in group practice. An expert technician is a special type of person possessing qualities of thoroughness and meticulous attention to detail which are found in

few people. I am sure there are many expert technicians lost to science who are now misfits in the "get-rich-quick" commercial world, which so often gives a premium to those who can best "put one over". We believe that a small group does not need a pathologist. A skilled technician will carry out the routine pathological, bacteriological and biochemical work quite as well as a medical man; in fact, most pathologists employ technicians for this work. Technicians must be made to feel that they are an integral part of the group, and that carelessness on their part will have repercussions on the whole unit. For any unusual tests or opinions a small group would not be able to supply a full-time pathologist with sufficient material to provide the background of experience so necessary to give expert opinions. Therefore we find it very satisfactory to send out for expert opinion such work as the examination of sections or the performance of unusual tests, which need greater experience than can be gained in a small group.

Similarly, with regard to radiological work, we do not consider it necessary to have a radiologist on the staff. We believe that X rays should be used merely as an ancillary aid to the clinician, and our eight years of experience have more than justified this belief. An expert technician is needed to take care of the equipment and to produce the best results in fluoroscopy and Röntgenography; but we believe that the specialist in each section is better equipped to interpret what is seen on the fluoroscopic screen or in a film than the man who is practising as a general radiologist. The heart and chest specialist, by examining his own patients by fluoroscopy and radiology, can correlate radiological with clinical findings; the man who is familiar with the clinical history of a dyspeptic patient will certainly pay more attention to certain parts of the gastrointestinal tract in his attempts to correlate the clinical with the radiological picture; the rhinologist who interprets his own films has an excellent opportunity for improving his radiological diagnosis, since in following up the patient he is constantly checking the diagnosis. The same holds true for all the specialists who have been using X rays as they should be used, purely as an ancillary aid, not only to diagnosis, but also to treatment. As in pathology, the radiological work requiring greater experience than can be gained in a small group, such as therapeutic irradiation *et cetera*, is referred to specialists outside the group.

Routine.

That more mistakes are made by not looking than by not knowing is an old and true dictum, which is particularly applicable to the practice of medicine. For this reason it is important that certain procedures should be followed in order to ensure that, as far as possible, no aspects of the patient's disorder are neglected. At the same time, it is equally important that these procedures should not add materially to the cost of the service. For this purpose it is advisable to use the services of clinical

clerks and technicians, both of whom become very proficient in carrying out routine procedures. The history of any previous illnesses which may have some bearing on the present disability, the weight, with notes on gain or loss, the condition of the teeth, the nutrition of the skin, the blood pressure, the results of urine examination, the haemoglobin value of the blood and the collection of blood for a Kline or Wassermann test, can all be carried out by a clinical clerk and a technician before the patient sees the physician. This saves a great deal of time for the physician, and obviates a certain amount of mental fatigue which is unavoidable in going over past history and in carrying out routine procedures. When the patient comes to the physician, he need only run through the already recorded data, then begin his interview with the history of the present complaint, which is often the most important part of the examination. It is impossible to over-rate the value of these routine procedures, especially blood tests. Unless one is very careful to examine the conjunctivæ it is difficult to diagnose even a severe degree of anaemia in some women, since so many of them simulate ruddy health by the assistance of skilfully applied cosmetics, while sunburn or tan in men will often disguise a reasonable degree of anaemia.

A routine test for syphilis is also most important. In our practice, in 10,000 consecutive cases a positive reaction was obtained in 0.95%, and in about one-half of these a luetic condition had not been suspected. It may be stated that an error of 0.5% may not be very great; but the serious consequences of untreated syphilis leave no room for excuse for or justification of this error.

Study.

No clinic can be considered fit to carry out its duties to the public unless its members make a conscientious attempt to become well informed on current medical and surgical literature. For this purpose we have formed a reading circle, in which are included a number of keen readers outside our own group. Meetings are held one night in each week. At these meetings two members in their turn abstract articles they have found interesting in their period of reading. Since each member reads a different set of journals, a very wide field of medicine and surgery is covered. A system of this type, while greatly simplifying the reading problem, cannot fail to keep members well informed.

Financial Relations With Patients.

It is our opinion that the patient's financial arrangements should be with the group and not with the individual practitioner. The ideal to be aimed at is that patients should come to the clinic with the knowledge that it is advantageous for them to be referred to the man most competent to treat their complaint, while the medical attendant should not be placed in the possible position of adopting standards of interest and treatment which might vary with the financial status of the patient or his

own prospects of remuneration. Dr. Richard Cabot, professor of clinical medicine at Harvard University, has stated that "the greatest single curse in medicine is the curse of unnecessary operations". If we admit that this is true, and I believe every critically minded practitioner will agree that it is not a gross overstatement, then we should free ourselves from prejudices in our search for an explanation of this tragic indictment of our profession. Is this disservice to the public brought about mainly by the incompetence of practitioners, or by the fact that scientific judgements are over-balanced by the prospect of pecuniary gain? If any of us were to consult a member of another profession on a problem on which we were not competent to give judgement, should we always be quite satisfied with a judgement when we knew that, from a negative decision, the consultant would gain a mere consultation fee, while a positive decision would net him ten or twenty guineas as well as the approbation which usually accompanies a successful major procedure? At least we cannot deny that, instead of being as honest as human nature permits, a few practitioners are as dishonest as the law allows. It is also true that in most instances human judgements vary with exigencies and circumstances; and therefore, in the interest of the best service to the public, practitioners should be defended from the temptation of pecuniary gain.

Provident Funds.

No group clinic can be considered successful unless it makes some attempt to provide some measure of security for its members. For this purpose a provident fund should be created, and a certain amount of the annual profit should be paid into this trust to provide family endowment in the case of death, for all the married members of the group, as well as a retiring allowance on reaching the retiring age. Other funds should be allocated for the benefit of lay members of the staff, to be drawn on when they sever their connexion with the clinic, or in necessitous circumstances, as the trustees of the fund may decide.

Conclusion.

It is our belief that group practice, by ethical, responsible individuals imbued with a proper sense of duty to the patient, and properly coordinated and controlled, offers great advantages to both the patient and the medical practitioner. To the patient it offers the most honest, most efficient and most economical service obtainable. It minimizes mistakes that are otherwise inevitable in the choice of a medical attendant, and supplies a method by which the technical and educational advantages of specialism may become available.

At the same time, by close cooperation with other members, the outlook of the specialist becomes less limited, and there is much less tendency to regard as of foremost importance any disorder which the specialist consulted is competent to treat. To the medical man it offers the educational advantages of

the study of a limited field, while the constant and intimate association with specialists in other fields offsets the narrowing influence of such a study. It enables him to provide adequate technical aid and equipment. It reduces the worry and anxiety of individual practice by the group's sharing of each other's difficulties, while it simplifies satisfactory arrangements for holidays, sickness and study leave in a way impossible to the individual practitioner without dislocation of his professional life. Finally, it offers him a stabilized income, with the economic security of partnership practice.

A TRIP ABROAD, 1937-1938.¹

By JAMES E. SHERWOOD,
Sydney.

IN making clinical observations on a trip abroad, it appears to the writer very difficult to obtain a correct perspective; also, when the interests were chiefly of a gastro-intestinal character, and medical at that, he must be excused for any undue bias on the one hand, and undue neglect on the other.

Cesophagus.

First, in dilatation of strictures of the cesophagus, and also dilatation in cases of cardiospasm (or achalasia), the use of Plummer's bougies seems a definite advance in therapeutics as well as in safety. I first heard mention of the treatment by Dr. Arthur Hurst at Guy's Hospital and later saw its performance by Moersch at the Mayo Clinic. A linen thread is swallowed twenty-four hours before the dilatation is to take place. Premedication consists of the administration of atropine. The proximal end of the thread projects through the patient's mouth and is easily threaded through the distal end of the introductory portion of the dilator. A metal olive has already been fitted on this introducer. The introducer, with its olive attached, is then slid down the length of the thread, which guides it to the required segment for dilatation.

Some of the apparent advantages are the following: (i) The guiding of the dilator by the thread makes its introduction very simple and safe; (ii) no force is necessary; (iii) olives of varying size can be slipped on the introducer according to the needs of each case.

In cardiospasm, hydrostatic or other dilators can be used in addition. In some cases a balloon inflated with air is used. "Retrograde bouginage" is never resorted to at the Mayo Clinic.

Stomach.

With regard to the stomach, I can do no more at present than merely mention some of the clinical features of interest.

Gastroscopy with Schindler's flexible gastroscope offers the greatest modern advance in the investiga-

tion of stomach conditions. It alone appears the method of choice in the diagnosis of gastritis—Schindler's superficial, atrophic, and hypertrophic gastritis; and "gastritis of the post-operative stomach" can be satisfactorily diagnosed alone by the gastroscope. This instrument has been introduced, not to attempt to supplant radiology and other methods of investigation, but to work hand-in-hand with them. Whilst the diagnosis of superficial ulceration can be made more easily with it than with X rays, deeper ulceration is still in the province of the radiologist to clarify; the same applies to carcinoma. Yet ulcers are found gastroscopically which have eluded the radiologist, and also some gastroscopists appear capable of diagnosing a neoplastic from a simple ulceration of the stomach in many cases. Again, when the radiologist reports a healed ulcer, the gastroscopist will be able to observe, at times, that the ulcer is not healed, and that further prolonged treatment is still advisable. More will be said of gastroscopy at a future date.

The dietetic treatment of gastric ulcer does not seem to have radically changed. The medical treatment seems to aim chiefly at present at the avoidance of alkalosis. Magnesium trisilicate is used by Hurst, in London, to replace the older alkali therapy; aluminium hydrate in colloidal solution is used in America for the same purpose. Feeding through a duodenal tube is still carried out by Wyard in London, and after years of experience he feels it to be the method of choice in the dietetic treatment of gastric and duodenal ulcer. Histidine treatment seems mostly to have passed by the wayside.

Hæmatemesis is still a medical and a surgical problem. Its source can frequently now be decided by a gastroscopic examination. Its treatment seems at present chiefly medical. Repeated small blood transfusions are sometimes given, at other times continuous drip transfusions, the latter sometimes with a view to preparation for operation.

Hurst and Ryle (*The Lancet*, January 2, 1937) seem to sum up the question from the transfusion angle very succinctly:

We have never seen a case in which operation failed to save the patient because the hæmoglobin was insufficiently high; the technical difficulties caused by the size, position and adhesions of the ulcer have always been the cause of failure.

As regards the surgery of ulcer (not our province) the general tendency everywhere seems for some form of gastrectomy to be replacing gastroenterostomy, except in the case of definite pyloric (or should we say duodenal?) obstruction.

Magnus, in London, has examined stomachs *post mortem* in cases of pernicious anemia, by a series of longitudinal microscopic sections, and found that the body or cardia of the stomach is the site of the atrophic changes, the pyloric end of the stomach and duodenum being normal. Such unexpected findings have also been made gastroscopically.

The fractional test meal is still in use to supply corroborative or contrary evidence, rather than the more definite findings obtained from X ray and gastroscopy.

¹ Read in part at a meeting of the honorary staff of Saint Vincent's Hospital, Sydney, on October 5, 1938.

Liver and Gall-Bladder.

In Philadelphia, biliary drainage has been for ten years, and still is, extensively carried out. Magnesium sulphate and olive oil are the only stimulants used. This method of investigation seems useful chiefly where X ray findings have been inconclusive, and clinical signs of gall-bladder disease are present (10%). They suggest that: (i) The presence of cholesterol or calcium crystals in the bile indicates a diagnosis of calculi in spite of inconclusive X ray findings; (ii) the presence of numerous cells indicates disease; (iii) the presence of organisms is of no significance unless a pure culture of streptococci is obtained; (iv) the parasite *Trichinomas duodenalis* is found especially in Italians, probably because of their habit of eating of raw vegetables. Bile drainage is of therapeutic value also.

When we come to liver function tests we find that a state of some dissatisfaction exists. In London chief reliance seems to be placed on the Van den Bergh reaction and jaundice tolerance test. In America liver function tests in general use are considerably more numerous. In *The Journal of the American Medical Association*, of January 5, 1938, Snell gives a list of 19 tests, chief among them being the Van den Bergh test, the estimation of the degree of bilirubinemia, the galactose tolerance test, the bromsulphalein test, tests for coagulation factors (prothrombin), and hippuric acid synthesis (from benzoic acid).

The Van den Bergh and galactose tests for jaundiced and bromsulphalein test for non-jaundiced patients appear most commonly in use.

Here I must mention also the advent of the prothrombin test and vitamin K administration. Perhaps the best summary of present information in connexion with the two is contained in the following extract from the *Journal of the Staff Meetings of the Mayo Clinic*, February 2, 1938, in the summary of the work performed by Butt, Snell and Osterberg:

The administration of Vitamin "K" together with bile or bile salts to patients who have jaundice has reduced elevated prothrombin times to within normal limits and in certain cases probably has prevented hemorrhage or has had a definite inhibitory effect on actual bleeding.

In other words, with or without the rather difficult estimation of prothrombin time, the administration of vitamin K, together with bile or bile salts, as a preliminary to operation on jaundiced patients looks as though it will be a safe routine procedure in such cases in the future.

Small Intestine.

Next we reach the small intestine, the clinical pathology of which (without some obstructive lesion) has chiefly been recognizable by watery diarrhoea and "hurry", visualized or not by X rays. Intestinal intubation has now been introduced by Abbott, of Philadelphia. A double-lumen or triple-lumen tube, an elongated duodenal tube in appearance, is used. One or two lumina lead to balloons for inflation, another lumen is reserved for the

aspiration of intestinal contents. The X ray screen is helpful in the introduction of the metal end into the duodenum. When the metal end reaches the third part of the duodenum the bag is moderately distended with air or an 8% solution of sodium iodide. After this the subject swallows 5.0 centimetres of the tube every ten minutes, the observer following the metal tip by X rays till it reaches the desired point. Apart from physiological uses, it is used therapeutically in paralytic ileus, intestinal obstruction *et cetera*. Perhaps the clinical application of this method will be best appreciated by the following extract from "Intubation Studies of the Human Small Intestine", by Abbott Johnson (*Surgery, Gynecology and Obstetrics*, April, 1938):

Intubation for the relief of intestinal obstruction has been attempted on 16 individuals with failure only in 3. While the symptoms in one or two instances were mild, the patients as a rule were desperately ill. In 9 instances function returned spontaneously following a variable period of decompression. Paralytic ileus and organic obstructions have responded in an essentially similar fashion.

Let us hope this measure will justify its presence more and more with the efflux of time.

The frequency of regional ileitis in the larger clinics abroad rather surprises one interested in medicine only. There seems to be a frequent history of preceding trauma. Preliminary ileo-colostomy, with resection later, seems the rule.

The Large Intestine.

Ulcerative colitis next claims our attention. Here the surgical treatment in chronic cases is the pleasing feature of recent work. Appendicostomy and caecostomy have been relegated to the past, also, as a rule, the time-honoured irrigations. Patients in the acute stage of the disease, receiving oxygen inhalations, blood transfusions, intravenous injections of serum, and glucose and starch enemata, are still in the province of the physician. Patients in the chronic stage and who, despite dietary adjustments and the treatment mentioned above, with superadded "Neo-Prontosil", are not responding, are now becoming surgical patients. Preliminary ileostomy, followed by colectomy and later ileo-sigmoidostomy, is now the routine. Sir Arthur Hurst seems more optimistic over this procedure than does Bagen at the Mayo Clinic.

The supervention of malignancy on primary polyposis of the colon is well stressed by Hurst and many others.

Perhaps here we may mention the palliative treatment of carcinoma of the rectum, as suggested by Raven, at the Gordon Hospital, in London. This consists in the intramuscular administration of 3.0 to 5.0 cubic centimetres of colloidal copper twice a week for four months. This is followed by rest for one week, then another four months' injections. The intrathecal injection of alcohol (ten minims injected drop by drop) for the pain of a growth low in the rectum is also used. It gives six months' relief.

For the sake of brevity I must pass on, leaving further discussion on gastro-intestinal topics to others.

Cardio-Vascular System.

In London, in the examination of the cardio-vascular system, radiology, practised by fluoroscopy of the heart in the antero-posterior, right and left oblique positions *et cetera*, seems to be replacing percussion. Cardiac failure is being divided into right-sided and left-sided varieties. To this Parkinson replies: "This distinction between right and left sided varieties is of doubtful value." He also thinks that exercise tests are of doubtful utility as tests for myocardial efficiency, since the pulse rate is controlled to such an extent by nervous reflexes. *Digitalis folia* in tablets seems destined to replace the less reliable tincture of digitalis altogether. "Salyrgan" seems the diuretic of choice. For the diagnosis of pericarditis with effusion in London, Wood requires an acute right cardiophrenic angle by X rays. At Massachusetts, Professor Means is suggesting air replacement and refills in certain cases.

In London the blood circulation rate is estimated with decholin. In America a double test with saccharin and ether is considered necessary.

It is suggested that "Uroselectan B" will shortly be used in the fluoroscopic visualization of the shunting of the blood in congenital heart disease.

Finally, the surgery of heart conditions seems well established: thyroidectomy for fibrillation and congestive failure causally related; pericardectomy for Pick's disease; and, to a lesser degree, cardiomentopexy for ischaemic failure.

Sympathectomy for hypertension still proceeds at the Mayo Clinic. It is also progressing at Saint Bartholomew's Hospital, London. Provided the cases are carefully selected before operation, the results seem sufficiently good to justify perseverance with the procedure; 70% of the patients operated on are benefited clinically.

In peripheral circulatory disturbances, sensory nerve block (avulsion only) is resorted to as a preliminary to sympathectomy, for the reduction of pain. In the sympathectomy for Raynaud's disease division of the preganglionic fibres instead of the post-ganglionic is said to give the best results.

"Paevex" treatment is reserved for embolic and thrombotic conditions rather than for Buerger's disease, chief reliance being placed on Buerger's exercises for that condition.

Diabetes Mellitus.

In regard to diabetes, ordinary insulin, zinc protamine insulin, and now soluble zinc protamine insulin are being used for treatment. Dietetic variations exist not only in different countries, but in the same parts of the same countries. Cesarean section is recommended for all diabetic mothers at the Mayo clinic.

The following is an outline of treatment for diabetic coma suggested by Robinovitz, of Montreal.

1. One hundred units of ordinary insulin are given intravenously.

2. One hundred units of ordinary insulin are given subcutaneously.

3. Two hundred units of protamine zinc insulin are given subcutaneously.

All are given within ten minutes. The protamine zinc insulin is given from a separate syringe, divided into four parts and given at four different sites.

4. Five litres of Ringer's solution are given intravenously within two hours.

5. Caffeine sodium benzoate, in a dose of 0.5 gramme (seven and a half grains) is given intravenously, practically as a routine, especially when there is respiratory failure.

6. Carbohydrate is given five hours later. Two oranges and one ounce of sugar are given every hour.

Ordinary insulin injected intravenously acts quickly; but its action is of short duration. Given subcutaneously it is slower and more prolonged in action. Protamine zinc subcutaneously is slowest in action and most prolonged.

Addison's Disease.

Wilder, at the Mayo Clinic, in his treatment of Addison's disease, gives chlorides, a low potassium diet and "Eucortin". Some patients he finds need only two to three injections of "Eucortin" in twelve months. He treats patients suffering from adrenocortical tumour as if they had Addison's disease, before and after operation; and, whereas formerly the mortality rate was heavy, none of the last nine patients so treated at the Mayo Clinic died.

Disorders of the Blood.

A case of autohaemagglutination occurred at Guy's Hospital while I was in London. Professor Witts explained that it was seen in many anemias, occurring in the cold only, and could be avoided by working at a temperature of 37° C.

Achrestic anemia does not seem very uncommon abroad. Treatment by repeated blood transfusion is used. The blood banks are of interest to the visitor to America. Supplies of serum are kept on hand, typed off, ready for use. They are used for transfusion after being kept for twelve days.

Sternal marrow puncture came into fashion and seems to be going out again, according to Morrison, of Boston City Hospital, and Watkins, of the Mayo Clinic. Watkins in 400 cases found bone marrow puncture of use in only one case, and in this the diagnosis was obvious on clinical grounds alone.

The "shift to the right" in the count of polymorphonuclear leucocytes seems helpful on occasions in the diagnosis of a doubtful case of pernicious anemia. In America no pains are spared in the active treatment of subacute combined degeneration, and satisfactory results are claimed in a moderately large proportion of cases.

Professor Best, at a lecture in London, stressed the possible clinical use of heparin as a prophylactic against thrombosis.

The Lungs.

As in cardio-vascular disease radiology seems to be displacing percussion as a method of examination, so in respiratory disease does it seem to be replacing clinical examination largely. Artificial

pneumothorax in the treatment of pulmonary tuberculosis seems well established; but, with the efflux of time, more and more discrimination seems to be used in the choice of cases for the procedure.

The red blood cell sedimentation rate is given much prominence as a prognostic factor and also in the estimation of the activity of infections. The Mantoux test has superseded the von Pirquet, and a reaction in infancy and absence of reaction in later life are both regarded as being of considerable diagnostic significance.

Thoracoplasty, whilst impressing me at times, depressed me, especially when noting the persistence of cavities some time afterwards, with their concomitant symptoms.

The tomograph, taking radiographic photographs of the lung at different horizontal levels, showed how easily central cavities would be missed in routine radiological examination. Tomography should soon diffuse very widely and tomograms be very numerous wherever chest disorders are being investigated.

The drainage of pulmonary abscesses through the bronchoscope, both in London and in America, seems to be a very successful procedure in suitable cases. Moersch reports cure in 75% of cases of acute pulmonary abscess and in 50% of cases of chronic pulmonary abscess. Moersch is also aspirating and dilating the bronchial tree with considerable success in cases of bronchial asthma. For obstinate cases of the latter condition the administration of gold is recommended in some quarters as being very efficacious. Gold is also considerably recommended in the treatment of rheumatoid arthritis (especially Still's disease) and also in proliferative forms of tuberculosis, a small dosage being used to commence and contraindications being remembered.

Miscellaneous.

Alcoholic Neuritis: The improvement recorded in the vitamin treatment of alcoholic neuritis, even when the patient partakes freely of alcohol at the same time, seems a remarkable advance.

Migraine: Russell Brain's treatment of migraine, like the rest of his work, seems well worth recording. His method is as follows:

1. Dietary restrictions, including avoidance especially of apples, oranges and eggs.
2. Attention to the psychological aspect.
3. The administration of ergotamine tartrate: (a) two tablets of one milligramme allowed to dissolve under the tongue, the dose being repeated hourly for three doses if necessary; (b) one-quarter or one-half dose subcutaneously; or (c) one-quarter dose intravenously. Contraindications are pregnancy and hyperplasia. Brain has seen no ill effects, such as intermittent claudication, gangrene *et cetera*, from these doses. Additional treatment in the form of the oral administration of "Luminal" for six months is also advised.

General Paralysis: Pyrexial therapy in the treatment of general paralysis of the insane, and also in the amelioration of Parkinsonism and other conditions, seems well established.

Diseases of Childhood: While admitting that I have unintentionally omitted things which should

have been mentioned, and also perhaps inserted things which I should have omitted, I should finally like to mention one or two matters from the Hospital for Sick Children, Great Ormond Street, and conclude with a note on "Neo-Prontosil".

Blood transfusion seems the treatment for *icterus gravis neonatorum* (in this it is a life-saving measure), hæmolytic anæmia, hæmorrhagic states, and hæmophilia. For the latter, in addition, snake venom is used for local application; horse serum is also administered, and recently, at Manchester, potassium bromide and egg white.

A very successful method of treatment of empyema in children is in vogue: a combination evolved from aspiration, rib resection and closed drainage.

In the prophylaxis of measles, convalescent serum is regarded as a certain preventive if given within six days of contact. Attention to the teeth and nasal sinuses commences early in infancy.

"Eunidine" (atropine methyl nitrate) is under trial in the treatment of patients with pyloric stenosis.

The degree of diminution of chlorides in the cerebro-spinal fluid content is considered the most valuable prognostic feature in all forms of meningitis.

The drug treatment of pyelitis consists in the administration, if necessary, in successive order, of alkalis, mandelic acid, ammonium phosphate, and "Prontosil". The sulphanilamide group of drugs is extensively used in the treatment of children with pyelitis, as mentioned, and also in most forms of meningitis, chiefly the pyogenic forms, and it is regarded also as almost a specific for meningococcal meningitis.

"Neo-Prontosil": This brings us now to the mention of "Neo-Prontosil". The following are some notes derived from a weekly discussion at the Mayo Clinic. Brown and Herrell have decided that: (i) it is less toxic than sulphanilamide, (ii) larger amounts can be given, (iii) its therapeutic value in oral administration is greater. Five doses, making a total of 4.0 to 5.3 grammes (60 to 80 grains) are given in twenty-four hours. No signs of toxicity occur when treatment extends over a period of months. The indications for use are: (i) infections with hæmolytic streptococci, including tonsillitis *et cetera*; (ii) pneumococcal pneumonia (in the absence of antiserum); (iii) chronic ulcerative colitis; (iv) cholangitis, osteomyelitis, *lupus erythematosus*, and pemphigus. Complications are hyperpyrexia and gastro-intestinal disturbances, such as diarrhoea. The latter can be avoided by giving the drug some time before meals. In septicaemia due to the hæmolytic streptococcus the mortality rate was originally over 70%. Two recent patients treated with "Neo-Prontosil" have both recovered.

In conclusion, I apologize for such a collection of ill-sorted statements. The only excuse I can claim is that one or two may be of service to a fellow practitioner, even in their present rough form.

Reports of Cases.

ACNE VULGARIS IN AN INFANT.

By JOHN C. BELISARIO, M.B., Ch.M. (Sydney),
Honorary Assistant Physician for Diseases of the
Skin, the Royal Prince Alfred Hospital; Honorary
Physician for Diseases of the Skin, the New South
Wales Masonic Hospital; Honorary Dermatologist,
the Renwick Hospital for Infants, Sydney.

Introduction.

THE rarity with which cases of *acne vulgaris* in infants are encountered in medical literature prompted the reporting of this case, which is the first recorded in Australia. It is of interest, both because of the almost complete absence of mention of such cases in current text-books and from the bearing such cases may have on the aetiology of acne.

Puberty and adolescence, with the accompanying hyperactivity of the sebaceous glands and concomitant greasy skin, are generally considered to be the primary features in the aetiology of acne. The older ideas that the *Staphylococcus epidermidis albus* or the *acne bacillus* were causative rather than superimposed are now more or less discarded. The newer ideas are substantiated by the experiments of Goldsmith¹ (London), who has made cultures from the normal skin and grown numerous organisms. At the same time, he has made cultures from comedones, which showed less organisms than those from the normal skin, and also cultures from acne papulopustules, which showed less organisms again or none.

The general belief now appears to be that some form of imbalance of the endocrine glands, possibly the gonadal glands in particular, as is evidenced by exacerbation around the menstrual cycle, plays a leading part in the aetiology. It would appear also that increase in the activity of the sebaceous glands and excessive oiliness of the skin are not the only factors concerned in the actual production of the lesions, because *acne vulgaris* does on occasions occur in individuals with dry skins, as in the case recorded here.

In 1935 mention was made in a paper read before the Section of Dermatology at the annual meeting of the British Medical Association, Melbourne,² that fungi grew best and were most commonly found on the areas of the body where the sweat was more alkaline; for example, the palms and soles. It was also mentioned that the lesions of *acne vulgaris* were found preeminently on the face, neck and trunk, but were rarely, if ever, found in the axillae, abdomen or groins, where the reaction of the sweat was less acid than on the trunk, face *et cetera*. Consequently it would seem feasible that a change toward the acid side in the reaction of the sweat may play a more prominent part in the actual production of the lesions than has previously been supposed. This change is, in all probability, due in some way to an imbalance of the endocrine secretions and is not entirely dependent (as evidenced by *acne vulgaris* occurring in individuals with dry skins) on excessive oiliness of the skin or hyperactivity of the sebaceous glands. Even so, such hyperactivity is not unknown in infants; for example, oily seborrhoeic dermatitis of the scalp. In addition, it is now believed by some authorities that the apocrine glands which occur in the axillae and groins are more closely connected with the sexual glands than are the eccrine glands. This belief is suggestive that endocrine secretions, other than those of sex, may play as great, if not a greater, part in the aetiology of *acne vulgaris* than sex-gland secretions.

Previous cases reported in the literature, as far as could be ascertained, are as follows.

The first case reported was by Kraus³ in 1913.

In 1923 Beatty and Bigger⁴ reported a case in a male, aged six months. The eruption had been present three months in the form of acne papules and pustulo-papules on both cheeks, with a few tiny comedones among them

and a few comedones on the lower lip and chin. No oil or application was previously used on the child's face. The *acne bacillus* and *Staphylococcus albus* were grown on culture.

In 1926 Ayres⁵ reported three cases, all occurring in males. One was aged twenty-two months and had had the eruption for two months. A second, aged five months, had had the eruption since ten days of age. A third, aged eight weeks, had had the eruption since birth. Two of the patients were being fed exclusively on the breast at the time the eruption began. All the patients were otherwise normal except for slight constipation and later a brief attack of eczema in one, seborrhoea of the scalp in one, and a brief attack of diarrhoea in one.

In 1923 Amshel⁶ reported a case of a boy, aged seven months, in whom the lesions had been present for three months. They consisted of comedones on both cheeks and to a lesser extent on the forehead and chin, and also in the ears. Several small papules and pustules were on the chin and cheeks.

Report.

The writer's patient, a male, aged seven months, was seen on May 20, 1938. The mother stated that spots had appeared on the baby's face four months previously. The baby was entirely breast fed, and no oily or other applications had been used on the face. The mother herself had not taken any medicines since the baby was born.

Examination revealed several cystic lesions of a reddish colour. Some papules and comedones were present around the mouth and on the cheeks. There was no *pityriasis capitis*, and the skin was of a dry non-oily texture. The baby appeared well nourished and healthy in other respects.

Comment.

The predilection for males in this series of cases seems not without significance in view of the fact that the severest cases of acne are usually encountered in males.

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- ⁵ S. Ayres: "Infantile Acne Vulgaris: a Report of Three Cases", *Archives of Dermatology and Syphilology*, Volume XIV, 1926, page 12.
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Notes on Books, Current Journals and New Appliances.

DIAGNOSIS AND TREATMENT.

"MODERN TREATMENT IN GENERAL PRACTICE", issued by *The Medical Press and Circular*, appears annually. A note on the third (1937) volume appeared in our issue of December 18, 1937. In the fourth (1938) volume the high standard shown by its predecessors has been maintained.¹ As its editor remarks, it "can rightly be regarded as a post-graduate course in itself". It contains chapters on the modern methods of treatment of numerous medical, surgical and dermatological conditions, and certain diseases of childhood. A new feature is the inclusion of five chapters on pitfalls in diagnosis, entitled "Pain in the Iliac Fossa", "Left Iliac Pain in Adults", "Diarrhoea", "The Diagnosis of Constipation", and "Umbilical Pain", respectively. The book should be of interest and value to general practitioners.

¹ "Modern Treatment in General Practice: A Year-Book of Diagnosis and Treatment for the General Practitioner", edited by C. P. G. Wakeley, D.Sc., F.R.C.S., F.R.S.E., F.A.C.S.; Volume IV; 1938. London: The Medical Press and Circular. Demy 8vo, pp. 451, with 113 illustrations. Price: 10s. 6d. net.

The Medical Journal of Australia

SATURDAY, JANUARY 21, 1939.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

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MEDICINE AND THE PUBLIC.

THE day is rapidly passing when it is possible for the same man who makes an outstanding discovery in medical science to make its beneficent results available to the general public. That great public, with a soul not perhaps "hydroptic with a sacred thirst", but certainly avid for the best and in particular the latest in therapeutics, needs a special class to supply a type of attention that is designed rather for the requirements of the individual than for those of the community. The medical research worker, unless he is one of the fortunate few who are privileged to put the capstone on the edifice, is in danger of being forgotten. He strives to clarify and refine "while the world stands aloof", and when he produces "the extract flaked and fine, and priced and saleable at last", he sees others benefit by his toil. John P. Peters, who recently delivered an address before the American College of Physicians on "The Social Responsibilities of Medi-

cine", draws special attention to these three classes of research worker, medical practitioner and public, and calls them "producer", "distributor" and "consumer".¹ The parallel is not quite exact, especially as regards the second class. The producer does not provide all the health commodities that the distributor handles, for these are not all of the material kind, though it must be remembered that even the altering psychological outlook of the practitioner of medicine is moulded by the great contributions to modern thought of certain more or less unsung philosophers. Still, the distributor learns from his own experience many things no producer can give him ready made; moreover he bears a tremendous responsibility. He demands more and more of the producer: facilities for post-graduate study, opportunities to utilize the diagnostic and therapeutic resources of large institutions, and so on. Provided he recognizes the point where his demands may impinge on the producer's orbit, he is right in making them.

Even with its drawbacks Peters's classification is a very useful one. Just how clearly divided the classes are is easily shown when a member of the first or second class himself falls ill. He promptly ceases to be a producer or distributor and becomes a consumer, and often one of somewhat exacting type. The consumer on his part belongs largely to the class known as "intermediate" in hospital language, and as such he complains of the rising cost of medical care, and, as Peters says, he wants the best care for the lowest price. He too is right in demanding that all the benefits made possible by the producer should be available to him, and his claims really cover the fields of industrial and preventive medicine. Indeed, the whole history of medicine indicates that but small progress is made while medicine concerns itself chiefly with the wealthier classes of society.

Now the general proposition that the best care should be available to all will be freely accepted by everyone. Recent events have shown how clearly

¹ *Annals of Internal Medicine*, October, 1938.

this is realized by laymen and medical men alike. The real difficulty lies in its application. What is the point, then, in restating a familiar problem? It is this. We must admit that Peters is largely right when he says that "even the organized forces of medicine contribute little but publicity". We must therefore accept a responsibility that is clearly ours. Medical men alone understand fully the problem of health, and they must be prepared to play as active a part in formulating schemes as in putting them into effect. Further, since it is clear, quite apart from politics, that eventually the community must provide a definitely greater proportion of the cost of medical care, the medical profession must try to lead in the march step by step towards the ideal. Such an ideal will never be satisfied by minimum requirements, and we must endeavour not only to produce constructive ideas, but to ensure that any organized plans for providing medical care for the community should provide adequately for each of the three classes: the producer, the distributor and the consumer. It is not too much to ask that we combine the theory and practice on the social side of medicine as on the scientific, remembering, as Francis Bacon said, that we should not deal with abstractions only, but should "let the active part be as the seal which prints and determines the contemplative counterpart".

Current Comment.

THE ANÆMIA OF CHRONIC ALCOHOLISM.

A. BIANCO and N. Jolliffe have made a close investigation of the parts played by disease of the liver, achlorhydria, nutritional factors, and alcohol itself, in the production of the anæmia that is often observed in those addicted to alcohol.¹ While studying alcoholic polyneuritis they discovered the frequent occurrence of macrocytosis and macrocytic anæmia in alcohol addicts. Other workers had described anæmia in pellagrins who were addicted to alcohol. In 75% of these the anæmia was of the macrocytic, hyperchromic class. It had also been

observed that macrocytic anæmia frequently occurred in patients suffering from hepatic cirrhosis. Bianco and Jolliffe undertook their investigations in order to ascertain whether a high incidence of macrocytosis was characteristic only of polyneuritis, pellagra and hepatic cirrhosis, or of an underlying liver disease or of alcohol addiction itself; or whether another factor played the decisive role. Their study of alcohol addicts was directed towards the problem. Of 159 patients 139 displayed evidence of polyneuritis, 40 of pellagra, 24 of "alcoholic" encephalopathy, 30 of hepatic cirrhosis and 48 of "alcoholic" stomatitis. Many exhibited two or more of the manifestations at the same time. These 159 patients are awkwardly designated the "complicated" group. Those with surgical complications, acute infections, syphilis or tuberculosis are not included. For control observations 25 addicts, who displayed none of the above manifestations or other stigmata of alcoholism, were selected, and the group is referred to as the "uncomplicated" group. The anæmia found was classified according to the size of the cells and colour index of the blood.

In accordance with the criteria and classification of M. M. Wintrobe, the subjects of this study who had anæmia were divided into four groups: those manifesting macrocytic, normocytic, simple microcytic and microcytic hypochromic anæmia, respectively. The authors designate patients who have four million red cells or more per cubic millimetre as non-anæmic, those with a lesser number as anæmic. On such a basis 61% of the "complicated" subjects, but none of the "uncomplicated" patients suffered from anæmia. The average size of the red cells in the two groups was found to be practically identical. The colour index in the "complicated" group, however, averaged 1.11 (it was 0.98 in the "uncomplicated" group), thus indicating definite hyperchromia. The incidence of macrocytosis in each series was about 50%. It was observed, however, that when the "complicated" patients were divided into those with and those without anæmia, the incidence of macrocytosis was greater in the former. It was also shown that the incidence and the degree of macrocytosis as well as the degree of hyperchromia varied directly with the degree of anæmia. The incidence of macrocytosis in the "complicated" group without anæmia was found to be rather lower than in the "uncomplicated" group. This seemingly was due to a greater incidence of simple microcytosis in the former. The "complicated" patients are divided into sub-groups according to the various diseases from which they suffered. Bianco and Jolliffe found that the incidence of quantitative anæmia in the listed diseases varied from 52.1% in those patients suffering only from polyneuritis to 75% in those with stomatitis. The average size of the red cells in the whole "complicated" group was found to be slightly above normal. This observation was likewise true for the various sub-groups except the pellagrins and

¹The American Journal of the Medical Sciences, September, 1938.

cirrhotics, whose red cells were of a size slightly below the upper limits of normal. In all five subgroups the averages of the colour index showed hyperchromia. The incidence of macrocytosis varied from 50% in the pellagrins to 62.5% in the "encephalopaths". It was shown that the combined incidence of normocytosis and macrocytosis was over 90% in all groups of patients except the cirrhotic, in which the figure was 79.2%. Microcytosis was most often found in the cirrhotic patients, in whom it seemingly occurred at the expense of normocytosis. Bianco and Jolliffe attributed this finding to the greater incidence of gastro-intestinal bleeding in that group. In the 25 "uncomplicated" subjects achlorhydria was found only once. In the "complicated" group it was present in 48.7% of 119 patients tested. No relationship was observed between achlorhydria and macrocytosis in these "complicated" alcohol addicts, as microcytosis occurred in 43% of those with achlorhydria and in 52% of those with free acid. Again no relationship was found between the degree of anaemia and the achlorhydria. Those with achlorhydria had an average erythrocyte count of 3,830,000 as compared with an average of 3,600,000 in those who had free acid.

As an index of disordered liver function, Bianco and Jolliffe arbitrarily selected the degree of bromsulphalein retention at the end of thirty minutes. In the "uncomplicated" group none of the subjects retained as much as 25% of the dye. The average was 9%. In the "complicated" group approximately half of the patients tested retained 25% or more of the dye. The average was 30%. Macrocytosis was observed in 52% of those who retained 25% or more of the dye, and in 58% of those whose dye retention was less than 25%. The criterion adopted by Bianco and Jolliffe for the diagnosis of hepatic cirrhosis was the presence of visible lateral abdominal veins. Accordingly the group embraced only those manifesting liver failure. Bianco and Jolliffe considered separately the patients who had and those who did not have an enlarged liver. In the "complicated" group 54% had enlarged livers. Of these, 47.1% had macrocytosis. It was noted, however, that 61% of the "complicated" group whose livers were not enlarged, also had macrocytosis.

Bianco and Jolliffe sum up by stating that macrocytic anaemia in the alcohol addicts investigated was not limited to those suffering from pellagra or hepatic cirrhosis, but was also observed in about the same frequency in subjects affected by polyneuritis, "alcoholic" stomatitis and "alcoholic" encephalopathy. No correlation could be found between the frequency of macrocytosis on the one hand, and achlorhydria, severity of liver damage or enlargement of the liver on the other. They regard the macrocytosis of the alcohol addict not as a manifestation of inability on the part of the liver to store a hæmatopoietic principle, but

as an extrinsic deficiency of some necessary hæmatopoietic substance that is required to maintain normocytosis.

MALIGNANT TUMOURS IN THE SUPERIOR APERTURE OF THE THORAX.

WHEN H. K. Pancoast in 1932 described "superior pulmonary sulcus tumour", not only did he describe as characteristic a group of symptoms and signs comprising humeral and brachial pain, Horner's syndrome, atrophy of hand muscles, and radiographic evidence of a small homogeneous mass at the extreme apex of the lung and of erosion or infiltration of adjacent ribs or vertebrae; but he also suggested that here was a particular kind of tumour, possibly arising from embryonic vestiges. This suggestion aroused much interest, although histological studies were made in only two of the seven cases reported, and in no case was autopsy performed, and it chiefly justified the attaching of a special name to the tumours, which are often referred to as "tumours of the Pancoast type".

That tumours of the Pancoast type are not uniform in their pathological basis has been demonstrated by reports of more than fifty cases, which have appeared since 1932. The tumours reported have usually been carcinomata of small bronchi; but sympathoblastoma, lymphadenoma and sarcoma, occurring near the pulmonary apex, have also produced exactly the same symptoms and signs. The concept of a particular kind of tumour that produces the special manifestations of superior pulmonary sulcus tumour is no longer tenable. The symptomatology of these tumours also is not invariable, depending as it does merely upon the contiguity of an infiltrating tumour to the important anatomical structures crowded in the narrow superior aperture of the hemithorax. J. J. Stein¹ has recently reviewed fifteen cases of "apical lung tumour", which might have been described as superior pulmonary sulcus tumours, and has pointed out that the time at which some of the symptoms and signs appear is variable according to the stage of the disease at which sympathetic trunks and bones become involved, although pain and weakness in parts innervated from the eighth cervical and first thoracic nerves have been the first symptoms in all cases.

It may be that Pancoast's tumour does not exist; but Pancoast's syndrome, complete or incomplete, is a clinical entity that should no longer be overlooked when present in patients complaining of humeral and brachial pain. Because they produce this syndrome it is likely that certain malignant tumours in the superior aperture of the hemithorax will continue for some time to be known as tumours of the Pancoast type.

¹ The Journal of the American Medical Association, October 29, 1938.

Abstracts from Current Medical Literature.

OPHTHALMOLOGY.

Carotid-Cavernous Aneurysm.

E. S. GURDJIAN (*Archives of Ophthalmology*, June, 1938) describes a case of carotid-cavernous aneurysm. The patient, an adult, was treated with digital pressure to the right common carotid artery for eight days; the common carotid artery was then ligated at the junction. A month later he was readmitted to hospital with recurrence of symptoms. The artery was exposed. A longitudinal incision was made in the internal carotid artery. The index finger, passed under the artery, controlled hemorrhage. A strip of muscle, 20.0 centimetres long and 0.25 centimetre in diameter, was introduced into the lumen of the artery and pushed up with a probe as far as the base of the skull. The result was satisfactory.

General Treatment of Tuberculous Eye Disease.

GUNTER STROMBERG (*Klinische Monatsblätter für Augenheilkunde*, Volume C, 1938) describes his experience in the treatment of 520 patients with tuberculous eye disease. The general treatment in tuberculous disease is the same no matter what organ is involved. The specific treatment applied was the use of tuberculin and gold preparations, and non-specific treatment was provided by attention to climatic and dietetic factors. The only proven action of tuberculin is the production of an acute inflammatory reaction in a tuberculous focus. One hundred and sixty-seven patients received specific treatment; but 100 of these were given a very few injections of tuberculin, 46 received from 25 to 50 injections, and 21 received 50 to 200 injections. The author discontinued the injections in 25 cases, because of malaise, headache and loss of weight. In another series of 40 patients actual aggravation was produced by the tuberculin; but this applied particularly when old tuberculin was used. Tuberculin produced increased intraocular tension in scleritis. The lesions of keratitis were not accessible to tuberculin. The eye disease of 23 patients with iridocyclitis was aggravated through the occurrence of precipitates and exudate in the aqueous and vitreous chambers, and the formation of synechiae. The patients with periphlebitis developed further retinal hemorrhages. The gold preparations produced similar focal reactions. Four patients were treated with gold alone, without any obvious result. Specific agents can aid healing only by producing focal reaction, and focal reactivation will

aggravate the exudative varieties of ocular tuberculosis. The fibrosing varieties in any case are in process of healing and therefore do not need specific stimuli. Climatic factors, with attention to diet and mode of living, offered the best results. According to the author, treatment should be undertaken in mountain resorts at a moderate height above sea level. Seaside resorts are not nearly so satisfactory, and low-lying country can be harmful. The air should be free from dust. The most important single factor is graduated exposure to direct sunlight. Exercise must be carefully regulated and the diet should be mixed and as salt-free as possible.

Blood Transfusion in Ophthalmology.

W. G. FREY (*American Journal of Ophthalmology*, May, 1938) remarks that, although blood transfusion is now used so frequently in many diseases, ophthalmologists in general have found few uses for this procedure. From a study of the literature and from his own observations, the author has presented some indications for its employment. He describes its use in persistent bleeding after a preliminary iridectomy, and also in recurring hemorrhage after a perforating wound of the globe, in a boy, aged six years. Blood transfusion is a well-established treatment in eclampsia, whether retinal hemorrhages are present or not. It has also been found useful in amaurosis with reduced visual fields after blood loss. It has been found beneficial in pronounced vitreous opacities, in keratitis, in repeated corneal ulceration, and in herpes zoster ophthalmicus.

Sulphanilamide in Gonococcal Conjunctivitis.

L. J. FERNANDEZ AND R. F. FERNANDEZ (*American Journal of Ophthalmology*, July, 1938) treated adults suffering from gonococcal conjunctivitis with 2-6 grammes of sulphanilamide each day in four doses. At first this was used as an adjuvant to milk injections and local treatment. Later milk injections were omitted, and later still no local treatment was given. Patients recovered in a spectacular manner and in a shorter time.

Effects of Sulphanilamide on the Eyes of Rabbits.

V. C. RAMBO (*American Journal of Ophthalmology*, July, 1938) has proved experimentally that sulphanilamide can be safely used in the conjunctival sac of rabbits as a saturated aqueous solution, as a fine powder, or as a 50% suspension in olive oil. Injection of a saturated solution into the anterior chamber caused dilatation of the pupil, which persisted for seven days. Injection of a heavy suspension produced exudative iritis. Sulphanilamide given by mouth in adequate repeated doses checks the growth of an observable culture of hemolytic streptococci in the vitreous chamber of a rabbit.

Injection into the anterior chamber of 0.2 gramme of sulphanilamide in watery suspension, together with a culture of hemolytic streptococci, has protected three out of four eyes from infection as effectively as sulphanilamide by mouth. The author considers that sulphanilamide should be applied locally to the eye as well as being given by mouth.

Effect of Tartar Emetic on Trachoma.

L. A. JULIANELLE, R. SORBY, J. S. SMITH AND A. C. LANGE (*American Journal of Ophthalmology*, June, 1938) present a preliminary report on the treatment with tartar emetic (antimony potassium tartrate) of patients with trachoma. Forty patients have been treated with tartar emetic introduced intravenously or in conjunction with local applications. Sixteen patients improved. Five patients were given the drug as an adjunct to grattage, with good results.

The Glaucoma of Epidemic Dropsy.

E. O'G. KIRWAN AND S. N. MUCKERJEE (*The British Journal of Ophthalmology*, June, 1938) point out that epidemic dropsy is the only general disease of which glaucoma forms an integral part; hence it is of importance in a study of the aetiology of glaucoma. Epidemic dropsy may be caused by ingestion of infected rice, infection spreading from person to person by contact, or ingestion of mustard oil. In the accompanying glaucoma a dilatation of the capillaries of the cornea, without inflammatory changes, is seen. The aqueous humour contains a much increased amount of albumin. The anterior chamber is seldom shallow. In epidemic dropsy the presence in the blood of a histamine-like base, which increases the permeability of the capillaries, has been demonstrated by Chopra and De. The osmotic pressures of plasma and aqueous humour, as well as their chlorine ion concentration, were determined and compared with those of normal subjects. It was concluded that in the glaucoma of epidemic dropsy the difference between the osmotic pressure of serum and of aqueous humour was considerably reduced owing to the protein in the aqueous humour. Filtration into the anterior chamber takes place by dialysis, as usual, but the equilibria concerned are at a level different from the normal, on account of altered permeability of the dialysing membrane.

Advancement of the Conjunctival Fornix in Spring Catarrh.

N. I. SKIMKIN (*The British Journal of Ophthalmology*, May, 1938) has used the operation of advancement of the conjunctival fornix in seven cases of spring catarrh of the upper lid. Two sutures are placed on the skin of the lid border to retract the everted lid over the horn spatula. An incision

is made behind the affected tarsal conjunctiva and three looped sutures are placed in the healthy bulbar conjunctiva, and the flap is dissected down. The tarsal conjunctiva is then separated from the tarsus, a beginning being made at the lid margin. This should expose the Meibomian glands glimmering through the tarsal substance. The author considers it bad practice to remove the tarsus, which is usually healthy. If found to be infected with trachoma, however, it should be excised. The operation is completed when looped sutures are passed through the tarsus one millimetre from its border, and out between the eyelashes, covering the denuded tarsus. The stitches are removed on the third day, and a few days later the patient is discharged from hospital.

OTO-RHINO-LARYNGOLOGY.

Intracranial Complications of Intranasal Infections.

CYRIL B. COURVILLE and LLOYD K. ROSENVOLD (*Archives of Otolaryngology*, June, 1938) discuss the intracranial complications of infections of the nasal cavities and accessory sinuses. A survey was made of the infectious intracranial lesions secondary to diseases of the nasal air passages and accessory sinuses in a series of 15,000 autopsies. A total of 62 cases were studied. In 11 patients sinusitis was associated with *otitis media*, and therefore it is questionable which lesion might have been responsible for the intracranial disease. In 51 patients the intracranial lesion was secondary to an intranasal infection. In one of these, syphilitic erosion of the base of the skull was responsible for the formation of an atrium for extension of infection into the intracranial space. In three cases the infectious lesions were secondary to bony erosion by tumour; in four other cases a tumour extending into the skull did not give rise to a septic lesion. In the first part of the study attention was given to the specific types of lesions arising from intranasal infections which might be encountered within the cranial cavity, to the possible sources of infections, to their pathogenesis, to their morbid anatomy, and to the associated lesions. The possible lesions resulting from diseases of the nasal air passages and accessory air sinuses are *pachymeningitis externa* and *interna*, extradural and subdural abscess, dural fistula, septic thrombosis of the cavernous or the superior longitudinal sinus (rarely of other sinuses), septic meningitis, and abscess of the brain of a variety of sources, types and locations. Frontal sinusitis was responsible for the intracranial lesion in 14 cases, extradural abscess in four cases, subdural abscess in six, and cerebral abscess in only two cases. Septic

thrombosis of the superior longitudinal (sagittal) sinus in this series was secondary to frontal sinusitis in two cases. Septic meningitis, on the other hand, was a primary or direct lesion, but was usually associated with and evidently resulted from some other infectious lesion in the frontal region. Ethmoiditis (18 cases) and sphenoiditis (22 cases) were frequently associated lesions. Their most common intracranial complication was septic meningitis, which was present in 16 and in 20 cases of these diseases respectively. In a number of these cases both sinuses were affected. Furthermore, in some instances the association of sphenoiditis and *otitis media* observed at autopsy made it difficult to determine which lesion was responsible for meningitis. Extension into the cranial space was usually by way of the *lamina cribrosa*. Thrombosis of the cavernous sinus following intranasal disease, present in a higher proportion of cases in other series, was present in only three cases in this series. In all three sphenoiditis was present. In three other patients thrombosis of the cavernous sinus was due to infectious lesions (boils or ulcerations) in the region of the nares. Intracranial complications consequent upon maxillary sinusitis are rare, being found in only four instances in the series. Direct extension with extradural and subdural lesions and with or without abscess of the temporal lobe is the rule. For reasons not entirely clear, maxillary sinusitis of dental origin is more apt to provoke intracranial suppurative lesions than any other type. In general, an acute infectious lesion is more apt to result in intracranial complications than is a chronic one. The reverse is the case in *otitis media* and in mastoiditis, in which chronic disease is the more prone to extend intracranially. To an even greater extent than in *otitis media*, such complications of nasal disease are apparently much more common in males than in females, the ratio being as four is to one.

Evolution of the Speech Organs of Man.

V. E. NEGUS (*Archives of Otolaryngology*, September, 1938) discusses the evolution of the speech organs of man. He concludes that it can be deduced from a comparative anatomical and physiological study that man is in an advanced position in respect of his organs of speech. He has the potentiality for producing sounds of varying quality, character and intensity. His anatomical make-up does not permit him to emulate many animals with greater vocal power in proportion to their size, but even so his voice can carry for longer distances. Speech can be adapted to give an infinite variety of inflections and thus assist man in expressing ideas. The human voice has also the advantage of helping to identify the speaker, owing to individual variations. Sounds of the pitch desired, with admixture

of overtones, are produced in the larynx; in man they are of pleasing quality because of the character of the vocal cords, which are neither too sharp-edged nor with too wide a surface of approximation. The sounds produced in the larynx are amplified and selected in the pharynx, mouth and nose, and in these cavities some of the overtones can be strengthened while others are subdued or suppressed. The relative size and shape of these cavities are subject to considerable voluntary variation. Other sounds can be produced by the action of the nasopharyngeal and the labial stops, and hissing sounds are produced at the teeth. The author emphasizes the fact that various factors have combined to bring into existence a mechanism well adapted for speech when the intelligence calls for its employment. In his opinion it is incorrect to state that the larynx and its vocal cords have been evolved primarily for purposes of speech. A much simpler organ would have sufficed for the bare vocal needs of man. He observes that after removal of the larynx speech may be carried on with success by expulsion of air from the gullet and stomach, with no great change from the quality of the voice before operation. It is only by the exercise of his intelligence that man is able to make full use of the speech organs with which he is provided.

Infections of the Nasopharynx and Bronchiectasis.

G. E. HODGE (*The Journal of Laryngology and Otology*, August, 1938) discusses the relationship of infection of the nasopharynx to bronchiectasis. He states that chronic sinusitis is frequently associated with non-tuberculous bronchiectasis. The infection probably originates in the nasopharynx and causes infection of the sinuses in cases in which there is some predisposing factor, such as an abnormality of development. Infected sinuses act as a reservoir and, with the constant outpouring of secretion, maintain an infection in the lower portion of the respiratory tract. The occurrence of bronchiectasis without sinusitis may mean merely that the drainage and ventilation of the upper part of the respiratory tract are good; it does not preclude the possibility that the infection originated in the nasopharynx. The initial cause of dilatation of the alveoli may be some congenital defect which allows dilatation in response to obstruction to occur more easily in some individuals than in others. These dilatations in the author's opinion may be regarded as a compensatory effort by the lung. Where bronchiectasis develops, the contributing cause is infection from above, with a resulting oedema and inflammation of the lung. This suggests that the dilatations, demonstrated by the various contrast media and Röntgen rays, represent not only dilated bronchi, but also large and small dilated bullae.

British Medical Association News.

SCIENTIFIC.

A MEETING of the Victorian Branch of the British Medical Association was held at Wangaratta by arrangement with the North-Eastern Country Subdivision, on July 16, 1938, Dr. J. P. MAJOR, the President, in the chair.

Clinical Demonstration.

In the afternoon the meeting took the form of a series of clinical demonstrations by the members of the honorary medical staff of the Wangaratta Base Hospital. A report of this meeting appeared in the issue of November 12, 1938.

Failure of the Peripheral Circulation.

In the evening a discussion on failure of the peripheral circulation took place.

Dr. IAN WOOD, who opened the discussion, said that William Harvey was born at Folkestone, Kent, in April, 1578. In 1615 he was appointed lecturer in anatomy at the University of Cambridge and in the following year he delivered a course of lectures in which he explained his discovery concerning the circulation of the blood. In 1628 he published his "*Exercitatio Anatomica de Motu Cordis et Sanguinis*", and dedicated it to King Charles I. For many years after this great discovery the attention of physicians tended to be focused on the heart as the sole organ of importance in the maintenance of the circulation. When circulatory failure occurred they did not realize that changes in the peripheral vessels might be contributing largely to the failure. During the present century, however, physiologists had made an intense study of the peripheral circulation, and they had shown the physicians many therapeutic measures that had proved to be life saving. The contributors in this field of research had been numerous; but the work of Dale and Lewis, in England, and of Cannon, in America, had been outstanding.

The circulation of the blood depended not only upon the force of the heart beat and the integrity of the valves, but also upon many other factors, including the volume of the blood in circulation and the volume and tone of the peripheral blood vessels. These consisted of vast collections of arterioles, capillaries and venules, the largest number of these tiny vessels being found in the splanchnic area, the skin and the skeletal muscles.

The volume of circulating blood in a normal individual was approximately six litres (ten pints), and a considerable proportion of this blood was harboured in the peripheral circulation. If the blood volume was depleted by hæmorrhage or dehydration, a point would be reached where it was impossible for the body to maintain an adequate blood pressure in the capillaries in spite of widespread compensatory vasoconstriction.

The volume and tone of the peripheral arterioles were controlled by nervous reflexes and chemical agents. The nervous control consisted of vasoconstrictor and to a lesser extent of vasodilator impulses, which arose from the vasomotor centre in the brain and were distributed by the sympathetic nerves. The vasomotor centre was stimulated by afferent impulses from many centres, including those along the carotid arteries and aorta, and also by adrenaline. In addition to these reflexes through the vasomotor centre, local reflexes occurred in the spinal cord and even in the peripheral nerves (axonal reflexes).

The chemical control of the peripheral field was brought about by a number of substances. Adrenaline constricted all the peripheral vessels except those in the heart, brain and lung, where it tended to have a dilator action. It might be liberated into the general circulation in large quantities as the result of stimulation of the adrenal glands by sympathetic nerves from the vasomotor centre. Adrenalin was also formed locally at the nerve endings of the sympathetic nerves.

Histamine caused vasodilatation after it had been produced locally as a result of the action of toxins or trauma.

Histamine was a normal constituent of tissue cells. Kellaway and Feldberg had shown that "cell injurious agents", such as snake venom and staphylococcal toxin, caused peripheral vasodilatation by the liberation of histamine. These workers had also demonstrated that at the same time other substances appeared which caused more prolonged vasodilatation. This work was not yet completed, and they had to be content to consider that toxins either from bacteria, ingested chemicals, or deranged metabolism, might produce vasodilatation and peripheral failure. The discovery of how these substances produced their effect should prove to be one of the greatest advances in clinical medicine.

The function of the peripheral vessels was to provide the tissues of the body with an adequate supply of blood. Any failure of the blood supply to an organ would impair its function. Each individual cell must have its constant supply of oxygen, water, salts, carbohydrates, proteins, vitamins and other substances. In addition the waste products of metabolism must be removed. Water, oxygen, carbon dioxide, and crystalloids, such as sodium chloride and glucose, diffused freely through the walls of the capillaries. On the other hand, the colloids, such as albumin and globulin, could not penetrate the vessel wall freely, and so for the most part they remained in the circulation and sucked in fluid from the surrounding tissue spaces by virtue of their osmotic pressure. The blood pressure in the capillaries not only promoted the flow of blood along the vascular channels, but also forced fluid through the vessel wall into the tissue spaces. There was thus a constant flow of substances in and out of the capillary vessels, the direction of flow depending upon the relative conditions inside and outside the vessel wall. The rate of flow along the vascular channels was most important, as it caused a rapid "turnover"; each cell had its nourishment supplied rapidly and its waste products rapidly removed. This led to rapid and efficient metabolism.

Oxygen was carried in high concentration by the hæmoglobin, which was locked up in the red blood corpuscles. Therefore in anaemia the oxygen-carrying capacity of the blood was greatly depleted and anoxæmia of the tissues resulted. Thus, in order to maintain tissue nutrition and excretion, it was important to study every aspect of the peripheral circulation: the structure, distribution and tone of the peripheral vessels, together with the volume and chemical composition both of the circulating blood and the surrounding tissues.

If the peripheral circulation failed there would be widespread vasodilatation, and the blood pressure in the capillary vessels and in the larger arteries, such as the brachial, would fall. The pulse became rapid and thready, and later quite impalpable. The patient was pale, and his lips, ears and extremities were slightly cyanosed unless there was extreme anaemia. The capillary return in his skin was poor. He was restless and often very frightened; but his cerebration might be quite clear. His extremities were cold and later his whole body felt deathly cold. Death was not far off.

Dr. Wood then briefly described the treatment of six patients who had suffered from peripheral failure of various types. The best method of combating the failure was determined by the underlying causes. The causes most commonly encountered in clinical work were, first, hæmorrhage, secondly, dehydration, and last, an important group due to failure of vasoconstrictor tone caused by toxins or an excessive bombardment of the vasomotor centre by afferent stimuli. Often several of these factors were acting in the same patient; but for the sake of simplicity each cause was considered separately.

In hæmorrhage the degree of failure depended upon the rapidity and extent of the blood loss. A hæmoglobin test and blood pressure estimations were of great assistance to the clinician in deciding whether blood transfusion should be done; but it was most important to observe the general appearance of the patient. Sometimes a massive transfusion of several pints of blood was indicated; but if the hæmorrhage was rapid and not extensive even one pint might produce a dramatic improvement.

In dehydration, depleted blood volume and starvation of the body cells of fluid and food were two of the many factors leading to a peripheral failure. The massive intravenous injection of sterile physiological fluids was a life-saving procedure. A 5% solution of glucose in normal saline or Ringer's solution was most commonly employed. Recently Australian manufacturers had faced the problem of preparing sterile physiological fluids that were suitably bottled so as to be ready for immediate use. These were now available to the medical profession.

Failure of the vasoconstrictor system caused by toxins or excessive afferent stimuli formed a large and difficult group which was being studied in many parts of the world. A notable advance had been the discovery of several drugs that were closely allied to adrenaline, but could be administered intravenously without such grave risks as accompanied the intravenous administration of adrenaline. Dr. Wood then discussed the administration of "Neo-Synephrin" (Stearns) by continuous intravenous drip. He had found that ten cubic centimetres of a 1% solution of "Neo-Synephrin" could be added to one litre of 5% glucose in normal saline solution and administered in from one to four hours, depending on the severity of the peripheral failure. "Neo-Synephrin" was thermostable and could be sterilized by boiling. When injected intravenously it caused a rise in blood pressure from widespread vasoconstriction. Johnson strongly recommended its use subcutaneously in cases of post-operative shock.

Metabolic toxins could sometimes be eliminated by suitable medication. Diabetes was an example of this. Dr. Wood referred to the treatment given in a severe case of diabetic acidosis with peripheral failure that he had previously reported.

In conclusion, Dr. Wood made an appeal for a more widespread recognition, not only of the syndrome of peripheral circulatory failure, but also of the factors producing it. Suitable intravenous therapy was rapidly becoming a safe and relatively powerful weapon of attack against this alarming condition.

Dr. S. O. COWEN said that at the outset he would like to pay a tribute to the soundness of Dr. Wood's work. It would be gathered from his contribution how thorough and careful his observations were; but owing to his modesty the fact might not be readily perceived that he had broken a good deal of new ground. At the present time the subject of peripheral circulatory failure was perhaps a more live one than any other in medicine and surgery, and Dr. Wood's work had contributed materially to the advances that were being made.

Dr. Cowen remarked that the whole conception of failure of the circulation had undergone such rapid changes that many found their knowledge of the applied physiology of the cardiovascular system to be out of date. To understand the recent advances and apply the results in practice, it had been necessary to relearn the physiology of the system, and because the information was largely contained in highly technical articles in scattered journals, that had been no easy task. He thought, therefore, that the most useful contribution he could make to the discussion would be to describe in summary and rather dogmatic fashion the present conception of the mechanisms involved in the failure of the circulation. They had to keep clearly in mind that there were two fundamental varieties of failure of the circulation: heart failure and peripheral circulatory failure.

Dr. Cowen said that the theory of the mechanism of heart failure had undergone almost a complete reversion to the "back-working" hypothesis which had been taught in his student days. It was at present believed, and with good grounds, that, though the primary fault in heart failure was incomplete systolic emptying of one or other chamber, the symptoms and signs were all due to venous congestion behind the overfilled cavity. The process started in the chamber that was most exposed to the mechanical strain resulting from whatever structural lesion might be present, and the evidences of failure might be for a long time confined to the territory of the veins that drained, directly or indirectly, into the affected chamber. It was necessary therefore to distinguish clearly between failure of the right side of the heart and failure

of the left side. The latter was the more common and was seen in classical form in essential hypertension. In that condition the left ventricle might for a long time withstand the mechanical strain imposed on it; but eventually it could no longer empty itself completely. The left auricle in its turn became overfilled, pressure arose in the pulmonary vein, and, as a result, dyspnoea, continuous or paroxysmal, manifested itself. That state of affairs might continue for years before the strain on the right ventricle began to tell, and overfilling of the right auricle with consequent rise of systemic venous pressure and resultant oedema appeared.

Dr. Cowen pointed out that in peripheral cardiac failure, on the other hand, the derangement of the circulation was such that the venous pressure was lowered and the return to the heart was diminished, which also entailed a diminution of the cardiac output. The prime fault was a disproportion between the total blood volume and the total vascular volume; this caused a reduction in the circulating effective blood volume. He stated that the disproportion might arise in various ways, and he gave three examples. Overt loss of fluid as a cause of disproportion might result from hæmorrhage or profuse diarrhoea. Capillary dilatation could act through nervous influences, as in shock, but also in part by direct toxic action and anoxæmia, as in pneumonia. The third example was that both factors might be at work. The dilated capillaries, because of mechanical and toxic factors, were unduly permeable and permitted increased transudation of fluid. That state was illustrated by the combination of lowered venous pressure and subcutaneous oedema seen in collapse in infective and severe toxic states.

Dr. Cowen went on to say that the prime indication in the treatment of peripheral circulatory failure was to deal with the cause. When that was not possible an attempt should be made to remedy the disparity between the total blood volume and the total vascular volume. When the disparity was due to deficiency of essential intrinsic bodily factors—of blood, as in hæmorrhage, or of fluid and electrolytes, as in severe diarrhoea—it was a comparatively simple matter to remedy the defect. When the disparity was due to the action of abnormal factors, the problem was more difficult; but much might be done, as Dr. Wood had indicated, both by the use of vasoconstrictor drugs and the administration of fluid intravascularly, such as glucose solutions, salt solutions and blood. Those measures must, however, be regarded only as temporary measures used in the hope that the patient would be tided over until the aetiological factor could be eliminated.

Dr. Cowen then referred to the fact that, in medical work especially, mixed types of circulatory failure often occurred. He instanced acute coronary occlusion as an example that would readily be recognized. Peripheral circulatory failure was usually prominent at the outset, suggesting an abdominal calamity; but it was often closely followed by such evidence of raised venous pressure as orthopnoea or cardiac asthma, which probably was caused by nervous factors. Nice discrimination was needed in treatment lest the intravenous administration of fluid should unduly raise the venous pressure and so aggravate the factor of heart failure. If the heart was already diseased, heart failure was more likely than peripheral circulatory failure; but when the heart was normal the reverse was the case. Pneumonia was another disease in which the mixed type of failure occurred. The element of peripheral circulatory failure, however, undoubtedly predominated. As yet it was not practicable to attack the problem from the standpoint of removal of the cause, and insufficient information was available about the possible value of the intravenous administration of fluid and stimulants in tiding the patient over when the collapse occurred relatively late and the natural cessation of toxæmia was not far off.

In conclusion, Dr. Cowen said that his excuse for bringing these rather elementary considerations into the discussion was that he believed that it was only by correct observation of the phenomena presented by failure of the circulation and by correct analysis of those observations that the treatment applied was likely to prove satisfactory.

Dr. W. A. HAILLES commenced by reviewing the story of the progress in treatment of shock, hemorrhage and collapse, in his knowledge, through the years that had gone. In the pre-War period his conception of collapse as a clinical entity had been very vague. Between 1914 and 1917 the existence of the three states as entities had been elucidated. Secondary shock was collapse from failure of the peripheral circulation, loss of circulating blood volume and concentration of the blood. The cause was thought to be histamine or the *H* substance, and the appropriate treatment was instituted. What occurred as a result of burns was analogous. Toxæmia and failure of the peripheral circulation led to collapse in gas gangrene. In the past two decades he had often seen at operations for intestinal obstruction or paralytic ileus abdominal incisions in which no red blood flowed, but on either side blood appeared as black spots. The explanation of such an occurrence was that the peripheral circulation had failed and that the hæmoglobin, though highly concentrated, had had its load of oxygen considerably reduced. He had the fixed conviction during those years when he was actively engaged at "immediate" operations at the Royal Melbourne Hospital, that surgery was futile in the treatment of patients with intestinal obstruction or paralytic ileus when there was evidence of failure of the peripheral circulation. His only regret was that he had not sought the explanation sufficiently keenly nor been able to apply the suitable treatment. Next in the sequence of events, Dr. Hailles referred to the advocacy of gas gangrene antiserum in the treatments of patients with general and localized peritonitis. He had thought the analogy with gas gangrene futile and the treatment expensive and useless. The only features that he thought in any way analogous were the terminal ones, the secondary shock and failure of the peripheral circulation, which were common features in cases in which death occurred from either condition.

Dr. Hailles said that in the next phase of his knowledge of the subject doubt was thrown on the entity of histamine or the *H* substance. It was realized that in secondary shock after accidents and after burns and particularly in intestinal obstruction with its associated toxæmia and dehydration, the same picture was evident: a dusky hue, rapid weak pulse, cold clammy skin and falling blood pressure. The beneficial effects of saline solution administered by the rectal and subcutaneous routes were well known; but those techniques were playthings in comparison with the continuous administration of intravenous saline solution as worked out by those interested in the surgical requirements and in the subject of water metabolism.

Dr. Hailles, after defining the physiological facts, proceeded to outline the practical problems involved. He said that the modern conception was that loss of tone and stasis in the capillary field were followed by increased permeability of the walls of the vessels and loss of fluid elements of the blood, with consequent increased viscosity and concentration. That conception had been established in a report of the Medical Research Committee of Great Britain in 1917 and it still had to be accepted. It was the mode of death in many diverse conditions in which the cardiac muscle itself was still healthy enough for life to be prolonged. The problems then were to establish the presence of peripheral circulatory failure, to estimate its severity and to control it if possible, at whatever stage it was encountered clinically.

Dr. Hailles said that his own knowledge of the importance of the subject dated back to a lecture he had attended in London in 1919, when the matter had been expounded by those who had been working under the auspices of the Medical Research Committee. Since then his interest had continued to be stimulated and his knowledge advanced by the work of Dr. Ian Wood and a succession of keen junior and senior resident medical officers at the Royal Melbourne Hospital. Dr. Wood, in his address, had indicated the way in which the dehydration factor could be assessed by a study of the clinical history and the keeping of nursing charts of the fluid intake and output and other cognate observations. Anyone who had had

his help in cases of extreme dehydration with threatened failure of the peripheral circulation recognized his knowledge and thoroughness. With his aid Dr. Hailles had succeeded in surmounting the obstacle of the vicious circle after gastroenterostomy. It would be difficult to imagine a more serious dehydration problem than that one. By the use of the balance charts, Dr. Wood was soon able to establish whether the fluid balance was positive or negative in cases that would last a few days; but Dr. Hailles was often anxious about cases of greater urgency. He wanted to know how the presence of peripheral circulatory failure and its degree were to be established in the first day or two after a burn or an operation. Peripheral failure might be obvious and severe in degree soon after an operation. Though the need for blood and fluid was apparent, it was difficult to gauge the fluid requirement, and the question arose of whether too much fluid could be used. On account of such factors as sweating and occasional vomiting the estimation of the fluid loss was inaccurate, and it was probable that the continuous administration of fluid intravenously by the drip method would be carried out. The danger signals that the patient was getting too much fluid in the day or two after operation would be observed if a watch was kept on the bases of the lungs, the extremities, the blood pressure and the pulse rate, as well as the output and intake of fluid. Dr. Hailles admitted that he often found himself in doubt on that important aspect and was inclined to run in only a limited quantity of fluid intravenously. He had been stimulated by Dr. Bolton, the medical superintendent of the Royal Melbourne Hospital, in some severe cases, to keep a check on the estimation of the hæmoglobin content during the course of the intravenous perfusion. Though the condition of the patient might be progressing unfavourably while fluid was being run in, the hæmoglobin percentage might rise possibly above 100 on the Sahli hæmoglobinometer scale. That must mean that the fluid was running out of the capillaries as fast as, or faster than, it was being perfused into the veins; this indicated the risk of edema, particularly pulmonary edema. Dr. Hailles illustrated that point by reference to a man whose hæmoglobin value rose from 80% to 110% before death two days after an operation. Seven or eight pints of saline solution as well as blood had been given intravenously, and at autopsy pulmonary edema had been observed.

Dr. Hailles suggested that the hæmoglobin percentage should be estimated and recorded before and just after operation to indicate the need for transfusion or perfusion, and from time to time after the first day or two after operation, in an attempt to gauge the volume of fluid in circulation and whether the fluid was being lost.

Dr. Hailles next referred to the feasibility of using serum as the fluid to be introduced, and mentioned that Dr. Bolton had interested him in that matter. It was important to know the effect of shock on the hæmoglobin percentage. An attempt had been made to gain information on that point by observation of the variations in cases of severe concussion without hæmorrhage; but the results were vitiated by an absence of information bearing on the percentage of hæmoglobin in the individual case before the shock was sustained; it might have been anywhere between, say, 85% and 110%; but as it would not have been estimated nobody could know.

At first sight, it might be doubted whether there were many occasions in practice for the application of the treatment under discussion; but for those who looked for them, they would be found on all sides amongst sufferers from the shock of accidents or burns, post-operative trauma, toxæmia of poisons, and infection and toxæmia, and dehydration of intestinal obstruction and allied conditions.

Dr. Hailles said that the effect of the continuous intravenous administration of "Neo-Synephrin" was striking, as had been instanced by Dr. Wood. He raised the question of how long failure of the circulation due to dehydration could be combated. He had considered the possibility that in all cases the injured tissue liberated a common substance that caused the failure. Biochemists and physiologists

would doubtless determine whether there was such a substance; but in the meantime clinicians had to watch for the manifestations of failure of the peripheral circulation and if possible to anticipate these manifestations, or if they were present to do what was possible to combat them.

Dr. H. BOYD GRAHAM said that he thought that it might be of interest to draw attention to the fact that there was a growing practice at the Children's Hospital to apply the methods of continuous administration of fluids to which reference had been made by Dr. Ian Wood and the other speakers. The apparatus, which had become familiar in the wards at the general hospitals, had an established place in the treatment of dehydrated and toxæmic infants and children. It should also be placed on record that to a large extent that life-saving improvement had been due to the same band of enthusiasts who had been at work at the general hospitals as resident medical officers before occupying resident positions at the Children's Hospital and, of course, Dr. Ian Wood had played an important part in that respect both at the Royal Melbourne Hospital and at the Children's Hospital.

Dr. Graham also was of opinion that there was a sphere of usefulness in the treatment of older patients which had not yet been adequately explored. He referred to the value of normal saline solution given by the intraperitoneal route to infants and young children and to the hydrating fluid of Kugelmass, consisting of 6% gelatine, 3% dextrose and 0.5% sodium chloride, which had been advocated originally for the prevention of the initial loss of weight of infants after birth, but which had a use also as a fluid that could be given by mouth to overcome the tendency to dehydration.

Dr. E. L. COOPER, after referring to circulatory failure in diabetes, loss of blood from hæmatemesis and the extraordinary peripheral failure that could be associated with "Avertin" anaesthesia, said that a distinction had been made between failure of the peripheral circulation, heart failure and the combination of the two forms of circulatory failure in which central failure with water-logging was, at a later stage, seriously complicated by peripheral failure. He stated that recent work had shown that the preparations of digitals had an effect in failure of the venous circulation in addition to central failure. There was a tendency to speak of peripheral failure as a unit, whereas there was, in reality, the proximal portion in the muscles to be considered as well as the peripheral portion; the capillary field in voluntary muscle should not be overlooked. The failure of the capillary circulation was, in part, mechanical. Patients lying in bed in a position that was more or less constant, who showed evidences of impending capillary failure, could be aided by such simple measures as raising of the end of the bed, bandaging of the limbs and the carrying out of passive movements to empty the large volume of blood that was apt to be static in the muscles. When they came to consider intravenous therapy, it had to be remembered that blood itself was the ideal medium, but that other fluids could be of great value. Hypertonic saline solution could be of use. He had noted that cane-sugar solution had been given intravenously and that it was said to have a more prolonged effect on the blood pressure. It was easy to sterilize. He had not had any personal experience with it. He had been glad to hear Dr. Hailes advocate the use of serum, and after what Dr. Hailes had said he would add hæmoglobin estimations to observations of the blood pressure and the pulse rate as guides in the control of the form of treatment under discussion. It was apparent that treatment should be started at an early stage and they should not wait until the patient was moribund and had permanent changes in the central and peripheral circulations and in the urinary tract.

Dr. LESLIE HURLEY said that there were many factors involved in failure of the circulation, and in over-concentration on one there was a tendency for the medical attendant to forget the others. He had been interested in the applicability of the continuous administration of fluid in pneumonia and in diabetic coma. Not so long before it had been considered wrong to give fluids in diabetic coma, as it was asking a failing heart to do something

that it was believed it could not do. With reference to pneumonia, he had noticed that though they encountered mixed types as a rule there were two different types of circulatory failure that might be operating in varying degrees. On the one hand, a patient would be progressing satisfactorily up to a point when a rapid fall in blood pressure occurred and peripheral circulatory failure developed, probably as a result of a disproportion between the volume of the circulating fluid and the capillary bed. On the other hand, the blood pressure might be satisfactory and perhaps rising in association with increasing distension of the veins of the neck; in such a case Dr. Hurley took it that the failure was central rather than peripheral. In pneumonia, he feared a sudden drop in blood pressure and also rise in blood pressure. The treatment indicated was different in each case. Hydrotherapy was still regarded as of value in the prevention of a sudden fall in blood pressure; as well as lowering the temperature it stimulated the capillary circulation and diminished the volume of the capillary bed. In addition the patients would receive some benefit from the free administration of fluid by mouth, alternating hypodermic injections of 0.5 cubic centimetre of pituitrin and of 0.5 cubic centimetre of adrenaline solution (1 in 1,000) every four hours. At times relatively big injections of strychnine (0.004 to 0.006 gramme, or one-fifteenth to one-tenth of a grain) were advantageous. Dr. Hurley commented that, from the preventive aspect at operations, over-chilling, undue handling and nervous alarm should be avoided. Continuing the discussion of the treatment of pneumonia, Dr. Hurley said that when the circulatory failure was central rather than peripheral, treatment by drugs was not impressive, but venesection was likely to be worth while.

Dr. Hurley said that recently he had observed the development of failure of the peripheral circulation in diabetic coma in the case of a patient he was attending in a hospital ward. One afternoon the patient had been admitted to hospital with glycosuria and no diacetic acid in the urine, while conscious and eating well. On the next day, though well in the morning, the patient had become restless and apprehensive in a manner suggestive of air hunger. Within seven or eight hours, the systolic blood pressure had fallen from 125 to 80 millimetres of mercury and the patient had become unconscious and unable to swallow. Insulin had been given every three-quarters of an hour, accompanied by intravenous fluid therapy, throughout the night. For four or five hours, during which eight pints of fluid had been introduced, the condition of the patient had become worse; then an improvement had taken place within three-quarters of an hour without alteration of the routine of treatment, and by the middle of the next day the patient had become apparently quite well. Dr. Hurley had felt that the administration of the fluid had had a good deal to do with the recovery of the patient, particularly as that experience had not been an isolated one. He also stressed the value of studying the veins of the neck. They would be found to be full in central failure and empty in failure of the peripheral circulation. When the average patient was lying supine, the jugular veins would often be visible for one-third of the way up the neck. If the venous pressure was increased, that vein became visible at a higher level, and if diminished it was visible only in the lower portion.

Dr. L. E. ROTHSTADT spoke briefly about the electrolytes concerned in the changes in the circulating fluids. He said that in the crises of Addison's disease sodium electrolytes were lost, and the arterial and venous blood pressures were lowered, and shock appeared. Under those circumstances the value of hypertonic saline solution became apparent. In the shock of coronary artery occlusion it was advisable to give small amounts of hypertonic saline solution. Dr. Hailes had referred to the absence of prolonged benefit from hypertonic solution on the blood pressure. It might be of interest to mention that the administration of 100 cubic centimetres of 15% sodium chloride solution might raise the systolic blood pressure by as much as sixty millimetres of mercury; but it was a fact that the elevation of the pressure was not maintained for long.

Dr. W. W. S. JOHNSTON discussed some of the theories of the cause of traumatic shock. The difficulty in accepting the histamine theory was that it was doubtful whether there was enough histamine present in the body or at the site of injury to produce the effect. The effect might be due to bombardment through the sympathetic nervous system by means of noxious stimuli. Dr. Cooper had referred to work that had been done making a distinction between the muscle and skin capillaries. Adrenaline had a different effect on the two groups; it caused the superficial ones to contract, but the muscular ones to expand.

Dr. J. B. COLE stated that he had been impressed by the manner in which a patient with paralytic ileus had recovered at the Adelaide Hospital; the recovery appeared to him to have been largely due to the intravenous administration of thirty cubic centimetres of 10% sodium chloride solution.

Dr. H. N. MORTENSEN said that the administration of fluid was a matter of great importance in the field of urinary surgery, especially in prostatic surgery and surgery of the lower part of the urinary tract. The patients often had damage in the central and peripheral circulatory systems as well as damage in the urinary tract. It had become customary to give saline solution intravenously before the circulatory failure could become dangerous. With reference to the water balance in general, it was customary to attempt to "beat the pistol". The kidneys only got the water when all the other viscera had been supplied. If the kidneys were short of water the stage was set for failure of renal function. That prospect was accentuated when the kidney was damaged. He had experienced some difficulty in getting nurses and resident medical officers to chart the intake and output of fluid in a sufficiently precise manner. The whole subject was an important and fascinating one; but it was desirable to be as exact as possible. There was too much guess work, and much of the value of the consideration of water balance disappeared in consequence.

Dr. G. A. PENINGTON said that he wished to draw attention to a few small points. Dr. Wood had mentioned the method of the continuous administration of fluids intravenously; but he had not placed any emphasis on the importance of the rate at which the fluid was introduced. If there was any possibility of central circulatory failure the rate should not be excessive. The rate could be controlled if the number of drops flowing per minute were counted. He pointed out that central circulatory failure might be precipitated suddenly, and referred by way of illustration to the occurrence of acute pulmonary oedema in a man with cardiac decompensation. Five litres (nine pints) of fluid had been introduced within twelve hours and the man had passed only 300 cubic centimetres (ten ounces) of urine during that period.

Dr. Penington expressed the opinion that the administration of saline solution by the intraperitoneal route, to which Dr. Graham had referred, had been neglected in the treatment of adults. It was a practicable method where there was no abdominal distension. When the solutions were to be introduced by the intravenous route meticulous precautions had to be taken, and if the special apparatus was not available they should not forget the intraperitoneal route.

Dr. J. P. MAJOR, from the chair, said that though it was the rule that no vote of thanks could be accepted at a clinical meeting of the branch by him in his official capacity, that rule did not preclude him from expressing his personal appreciation of the high standard that had been attained by Dr. Wood and others who had contributed to the discussion that night.

In pneumonic and other toxic states, Dr. Major said that though deaths were commonly put down to heart failure, he, too, was of the opinion that failure of the peripheral circulation was at times an important contributory factor, especially when the pneumonic consolidation was a large one. He had formed the impression that hypodermic injections of pituitrin and adrenaline when given early might be of great benefit. He had not had experience of the efficacy of "Neo-Synephrin", and he would like to be informed whether it had an adrenaline-

like action or a lasting effect, and whether it was likely to be of more value than pituitrin and adrenaline in the type of case to which he had referred.

Dr. J. B. DEVINE made reference to the difference in the action on the blood pressure of "Veritol" and "Neo-Synephrin". "Veritol" could be given orally and the blood pressure was raised only to the pressure normal to the subject; "Neo-Synephrin", if injected then, would produce a further rise in the blood pressure.

Dr. Ian Wood, at the invitation of the President, replied to points raised in the discussion. He said that the effect of "Neo-Synephrin" persisted for two to four hours, whereas adrenaline was poorly absorbed and rapidly destroyed and had but a transitory action on the peripheral circulation. With reference to histamine, Dr. Wood said that Dr. Feldberg considered that too little histamine was liberated in damaged tissues in the usual case of traumatic shock for the shock to be ascribable to the histamine. In addition, the histamine liberated was destroyed by histaminase in the circulation. The local swelling was probably a histamine effect. The position might be different in the case of burns.

He had not had any experience of the value of the intraperitoneal administration of saline solutions in older subjects, but had preferred the subcutaneous route if it were necessary to use a route other than the intravenous. Whether the fluid were given intraperitoneally or intravenously, it must be carefully and accurately prepared. He recommended the "Soluvac" preparations for intravenous work; he had found them reliable, and they were readily available in emergency. He was in agreement with Dr. Mortensen about the difficulties with nurses in the charting of accurate measurements of fluid intake and output.

Commenting on Dr. Hurley's remarks, Dr. Wood said that if adrenaline was injected into a patient suffering from pneumonia with failure of the peripheral circulation, a very small wheal appeared at the site of injection, and it was easily overcome by means of a tourniquet, in contradistinction to the wheal of normal size and the usual tourniquet effect. He had found it very difficult to generalize about the value of hypertonic saline solution. If the patient was not short of chlorides, injection of hypertonic saline solution caused a rise of blood pressure for a short time. The patients who were vomiting copiously, losing chlorides and becoming depleted of fluids were those that were greatly benefited by hypertonic chloride solution. Where there was failure of the peripheral circulation without loss of chlorides, injections of hypertonic saline solution were not advisable.

The rate at which fluid should be introduced by the drip method was determined by the demand for fluid. As a rough guide he mentioned that the average patient suffering from ileus required about 3.5 litres (six pints) of fluid during the first twenty-four hours; thereafter he would be guided by the demand estimated on clinical grounds. If there was inconsiderable loss of fluid though shock was present, the patient would probably be suffering from peripheral dilatation and the indication was to raise the pressure of the peripheral circulation by "Neo-Synephrin" or by other means.

Special Correspondence.

LONDON LETTER.

By OUR SPECIAL CORRESPONDENT.

THE recent visit of the Editor of THE MEDICAL JOURNAL OF AUSTRALIA to the headquarters of British medical journalism has been welcome. The closer the contacts between the two great medical journals—British and Australian—the better must it be for medical journalism in general and the profession in particular. That some such strengthening of the bonds has resulted from this visit is beyond doubt.

Those Australian members of the British Medical Association of whom it has been whispered that they never bother to open the older and more distantly produced journal, must now count themselves "back numbers" as hopeless as the journals they are reputed never to open. So completely has *The British Medical Journal* discarded its mid-Victorian petticoats and crinolines and so thoroughly has the editorial staff seized its opportunity to substitute for the old order of things a better presentation of current medical progress as to make the journal they edit one of the most attractive medical periodicals of the day. That the vitalizing treatment to which these changes are due owes part at least of its therapy to Australian representatives on the Central Council forges yet another bond between the revived old lady of Tavistock Square and her younger and vigorous daughter of the southern hemisphere.

Of the many striking managerial and editorial changes recently achieved in *The British Medical Journal* none is of greater all-round utility than the substitution for the obsolete "Epitome" of the "Key to Current Medical Literature". No matter how carefully or ably a journal with some 40,000 readers—or is it only subscribers?—is edited, it cannot possibly hope to please everybody; but the Key should go a long way to meet the requirements of both the general practitioner and the consultant. Of the many recent improvements in the journal none has proved so costly as the introduction of this Key, because it has meant, among other things, the purchase of many journals not previously available to those who consult the library at headquarters; but this, of course, is money well spent and to the advantage of everybody. The Key is particularly welcome to all English resident Australians because the contents of *THE MEDICAL JOURNAL OF AUSTRALIA* find a permanent and honoured place therein, and we are enabled to follow more easily what our Australian medical colleagues are doing to further the advance of medical science.

To pass from up-to-date medical journalism to the world crisis of barely three months ago is not quite so outmoded as it seems. To wake up on one of those lovely autumn mornings which only England knows, with the full expectation of being bombed out of existence by nightfall, is no fit subject for jest; yet the possibility of the happening was not only there then, but is with us still. If this should happen the medical profession will be right in the front of the fight from the first. Naturally, the British Medical Association is taking time by the forelock and has already been in consultation with the Government. It would be the merest impertinence for an English correspondent to suggest to Australian readers what they should or should not read, but in view of the crisis—past it is true, but before these lines are in print, another and a worse one may be on us—reference may be made to the leading article in *The British Medical Journal* of October 8, 1938, to the correspondence which followed, and more particularly to the report of the Association's official delegation to the Minister for Co-ordination, Sir Thomas Inskip, in the "Supplement" of November 19.

Even at the risk of carrying coals to Newcastle or of being accused of the schoolboy's unpleasant and irritating habit of teaching his grandmother to suck eggs, it may be pointed out that one of the recent new developments in chemotherapy—the introduction of "M and B 693"—is attracting a considerable amount of attention. If further experiment and extended clinical use justify the claims for it—that it is effective against the pneumococcus—its introduction into modern medicine warrants this reference.

The Dominions Committee of the Central Council has recently introduced a little light and welcome relief after the official voyages its agenda constantly make round the whole of the medically inhabited globe. It invites all overseas members of the Association who may happen to be in London on the dates of its meetings to meet the officers and members of the committee at an informal tea in B.M.A. House. Australian members of the Association, who may happen to be in London on the days of these meetings, need not wait for an invitation, though the

secretary does try to get into personal touch with all overseas members known to be in town. Australians are always welcome, and the dates of the meetings can always be seen in the official calendar in *The British Medical Journal*.

The Oxford University Press has just published for a former member of the professorial staff of the University of Melbourne, Professor Berry, a really superb example of the typographer's art—a cerebral atlas illustrating the difference between mentally defective and normal individuals, with a social, mental and neurological record of 120 defectives during life, and over 400 photographs.

Correspondence.

AN AUSTRALIAN MEDICAL ASSOCIATION.

SIR: I have read with interest the presidential address of Dr. Neville G. Sutton, of Queensland, and am heartily in accord with its subject matter. But I cannot refrain from comment on what he says about the formation of an Australian Medical Association affiliated with the British Medical Association. Why is it necessary for us to cease to be branches of the British Medical Association? The question of distance and time has been removed with the advent of the air mail. Dr. Sutton then refers to "the variation of legal obligations and social conditions" necessitating "independence of action". The members should be aware that this independence of action can and will be granted to the Federal Council and through them to the Branches as soon as the Council and the Branches set their house in order and become corporate bodies who can accept liability for their actions.

What more do we want than this? We will have independence but remain members of the British Medical Association with all the privileges and honourable traditions that that membership carries with it.

Yours, etc.,

LINDSAY DEY.

310, Miller Street,
North Sydney,
New South Wales.
January 7, 1939.

LAY MEDICAL PRACTITIONERS.

SIR: It is stressed by politicians that under the new *Medical Practitioners Act*, "lay" practitioners will not be forbidden to treat patients for payment. At present persons who have not obtained by examination certificates in steamship navigation, plumbing, electrical work and boiler management, are not allowed to do ferry skipping, plumbing, electrical work or boiler manipulation with or without fee. Does this mean that the Government considers that a non-certificated lay health practitioner is less dangerous to the public than a non-certificated steamship skipper, plumber, electrician or boiler attendant, or is it that a stricter attitude is adopted towards "lay" skippers, plumbers, electricians and boiler attendants than towards "lay health practitioners"?

Again, after six years' university tuition, a medical graduate is not considered fit to practise until he has done an extra year in hospital. A lay practitioner is considered fit to be registered without any training. Is this logical? Strictness towards medical graduates in the standard of training and in ethics is desirable, and is in the interests of the public, and there are many strict—one might say repressive—clauses concerning the trained medical graduate, but practically only one (*re blatant advertising*) towards the untrained lay practitioner.

Again, is this logical?

One has been asked what would happen if the future university-trained medical graduates were to choose the line of least repression and become registered as lay

practitioners (whilst following the ethical rules of the medical profession). Another point is that only trained university graduates can be registered as veterinary surgeons. The law allows an untrained "medical practitioner" to do to a man's son what an untrained "vet" is not allowed to do to his poodle.

Yours, etc.,

KEVIN BYRNE.

Lakemba,
New South Wales,
January 9, 1939.

TRIGEMINAL NEURALGIA.

SIR: "Don't!" This was *Punch's* famous advice to those about to be married.

"Don't!" This is my advice to any practitioner who is thinking of suggesting a major operation for any sufferer from trigeminal neuralgia. I really have had only about ten years' experience of the results of this operation, so perhaps I am a little premature with my judgement; but in my opinion, and judging by the result in my own case, if my advice be disregarded the patient will live to curse the man who suggested the job, the surgeon or surgeons who performed it (or them), even the poor anaesthetist for doing too well in allowing the patient to "come out" of the anaesthetic or anaesthetics.

Having tried practically every known analgesic for this "after-pain" and found none of them of the least effect, the only thing I can suggest by way of relief would be half an ounce of dilute hydrocyanic acid. I have been sorely tempted on many occasions to try this, but up to date have not summoned up sufficient courage.

By the way, the severe and constant after-pain is not the only bad result of these operations. There are as well many other distressing symptoms; for example, all sorts of "electric shocks" and "flashes" over the whole area supplied by the divided nerve, also all sorts of sensations of fine movement in areas which do not normally move, such as the ala of the nose, the area over the malar bone *et cetera*.

Yours, etc.,

ALEC LYONS.

Eaglehawk,
Victoria,
January 7, 1939.

SHORTAGE OF DOCTORS IN VICTORIA.

SIR: The report of a committee of the Victorian Branch of the British Medical Association published in your issue of January 7 on the shortage of doctors in Victoria calls for comment.

The report in effect states that there is no shortage and then proceeds to point out why it exists in the country districts. The facts are that in Victoria the proportion of practitioners to population is somewhere between 1 in 1,100 and 1 in 1,200. In England it is 1 in less than 1,000, and yet the Regius Professor of Medicine at Oxford (Sir Farquhar Buzzard) stated that England could well do with double the number if they were properly used.

Adelaide and Queensland Universities report that they are not supplying the local wants. This means in effect that Sydney and Melbourne are partially supplying South Australia and Queensland, and in addition Tasmania and Western Australia.

My experience in connexion with the Victorian Bush Nursing Association is definite. Kooloonong, Ultima, Woomelang and other hospitals have closed or are closing for the one reason only, namely, no doctor obtainable. Yet all the places, except Kooloonong, have been served by practitioners for many years, and yet now no doctor is obtainable. In larger cities, as the report points out, the number of practitioners has decreased. Stripped of all

side-issues, it means that the call of the city is too strong. It is estimated that 60% of the practitioners in Melbourne are giving honorary service of various kinds to the public hospitals, partly no doubt with the vain hope that they may secure some position of importance at some time. It is obvious that the number of coveted positions is not sufficient to provide for them. Yet in a number of Bush Nursing hospitals, excellently built and staffed, no practitioner has been available for months at a time.

The optimistic forecast of the committee may be realized—I hope it will—but I am not at all confident. Two, and possibly three, more Bush Nursing hospitals will close shortly, and one of them offered a guarantee of £700 *per annum* to a practitioner who would take up residence near by.

If decentralization is not a piece of idle verbiage and is really meant, it is not materializing and has been further attacked by the decisions of the Nurses' Wages Board. These decisions do not affect the salaries offered, which are in general higher than the award; but the specification of hours of work *et cetera* makes compliance difficult when nurses as well as doctors are difficult to obtain.

In the circumstances, is there any wonder at the diminishing birth rate, the crowding of flats and the like? We have something to learn from the totalitarian countries, however much we may dislike their methods.

From our experience of the country we have learnt that the country people, especially expectant mothers, have an intense desire to be treated near their own homes in properly equipped and staffed hospitals and with their own doctor. They have no desire to be taken miles away to a base hospital and removed from their families and friends. To effect this end they have found tens of thousands of pounds to build modern hospitals in their country centres, and now they find medical practitioners are not available.

If residents of Sydney or Melbourne were informed that if they became ill they must travel 20 to 100 miles to obtain attention, they would soon become vocal and we should hear much of want of humane consideration.

I am afraid our social system has got into a tangle, and for the moment it is difficult to see, as regards the subject of this letter, how it can be unravelled, unless the profession adopts a different outlook.

Yours, etc.,

JAMES W. BARRETT.

103-105, Collins Street,
Melbourne, C.I.,
January 13, 1939.

MEDICAL CERTIFICATES FOR INJURED PERSONS.

SIR: I want to most strongly support the remarks of Dr. Kesteven as quoted by Dr. Miller in the journal of January 14, 1939, and to condemn violently any departure from common truth-telling in the name of expediency.

Faced with a certificate, "This is to certify that Mr. 'X' is suffering from . . . due to an accident", I have always crossed out and initialled "due to an accident".

I class the patient's word as hearsay evidence for the purpose of a certificate, and regard Dr. Miller's letter as incitement to incorrect certification.

Yours, etc.,

C. C. MCKELLAR.

Bondi,
New South Wales,
January 14, 1939.

GAS WARFARE.

SIR: The writer has lately been reading a few manuals on gas warfare. We have been reading so much about gas of late years that I felt it behoved me to become acquainted with the matter. The people consider our profession

endowed with wondrous knowledge on all things medical, and look to us for guidance. It was with some horror that I discovered my abysmal ignorance of the matter. I do not doubt that the younger generation of medical men are now coached in this important subject. There must be many, however, like myself, who do not know the smell of one gas from another, nor the symptoms, nor the treatment for gas effects.

In my book the author prescribes some first-aid treatment and then gives the laudable (?) advice: "Seek medical attention as soon as possible." It is to be hoped that any potential enemies our country has will not launch gas attacks till the doctors have been trained.

Would it be possible and advisable to have some instruction on the effects of gas and its massive trauma in our medical journal? A recognition of responsibilities in this respect by our profession would be a fine lead to those whose duty it is to help the public in times of gas attack, but who do not consider the time yet ripe, in spite of repeated warnings from patriotic workers.

Yours, etc.,

J. R. S. LAHZ.

Wickham House,
Wickham Terrace,
Brisbane.
January 13, 1939.

TREATMENT OF A PNEUMOCOCCAL INFECTION WITH "M AND B 693".

SIR: The following case appears to be worth reporting. The patient was a woman, aged forty-four years, who was desperately ill on admission to hospital, with rapid pulse, rapid breathing and bronchopneumonia. Large sloughy patches were present over the mucous membrane of mouth and throat. She also had a purulent discharge from the vagina, with similar patches on the vaginal mucous membrane to those on the mouth and throat. A swabbing yielded a pure culture of pneumococci, both from mouth and vagina. The patient was then given "M and B 693", commencing from the fourth day of the illness, the dose being four tablets as an initial dose, four tablets four hours later, and thereafter two tablets four-hourly.

There was a dramatic change in the patient's condition, and within twenty-four hours the patient's general condition had improved materially, the temperature dropping rapidly and returning to normal on the second day of treatment, and remaining down.

The outstanding feature was the rapidity with which the sloughy condition of the mouth and vagina cleared up, and which makes this case so well worth recording.

The patient was able to leave hospital and her chest was clear and mouth and vagina in their normal healthy condition ten days after commencing treatment.

Yours, etc.,

J. GOLDMAN.

Smart Street,
Fairfield,
New South Wales.
January 13, 1939.

Proceedings of the Australian Medical Boards.

NEW SOUTH WALES.

THE undermentioned have been registered, pursuant to the provisions of the *Medical Act* of New South Wales, as duly qualified medical practitioners:

Laing, John Joseph, M.B., Ch.M., 1924 (Univ. Dublin),
10, Monterey, Hollywood Avenue, Waverley.

Livesey, Stanley Martin, M.B., Ch.B. (Univ. Edinburgh), F.R.C.S. (Edinburgh), c.o. Bank of New South Wales, Sydney.

Kaines, Raymond Hannay, M.B., B.S., 1926 (Univ. Adelaide), Public Hospital, Broken Hill.

Gild, Jack Lawrence, M.B., B.S., 1937 (Univ. Melbourne), 9, Melby Avenue, St. Kilda, Victoria.

Kurrie, Ernest Nicholls, M.B., B.S., 1937 (Univ. Melbourne), Murwillumbah.

VICTORIA.

THE undermentioned have been registered, pursuant to the provisions of the *Medical Act*, 1928, of Victoria, as duly qualified medical practitioners:

Hughes, Arthur Russell, M.B., B.S., 1937 (Univ. Melbourne).

Strang, David Attley, M.B., B.S., 1938 (Univ. New Zealand).

Schneebaum, Moses, M.D., 1935 (Rome).

Gretton-Watson, Bernard, M.R.C.S. (England), L.R.C.P. (London), 1922.

TASMANIA.

THE undermentioned have been registered, pursuant to the provisions of the *Medical Act*, 1918, of Tasmania, as duly qualified medical practitioners:

Reid, John William, L.R.C.S. (Edinburgh), L.R.C.P. (Edinburgh), L.R.F.P.S. (Glasgow), 1937, Royal Hobart Hospital, Hobart.

Hillman, William Arnold, M.B., B.S., 1938 (Univ. Sydney), Royal Hobart Hospital, Hobart.

Phipps, Kathleen Elizabeth, M.B., B.S., 1922 (Univ. Melbourne), St. Mary's.

Appleby, Harold Henry, M.B., B.S., 1925 (Univ. Adelaide), Rosebery.

Books Received.

HANDBOOK OF SANITARY LAW FOR THE USE OF CANDIDATES FOR PUBLIC HEALTH QUALIFICATIONS, by B. B. Ham, M.D., D.P.H.; Twelfth Edition; 1938. London: H. K. Lewis and Company Limited. Foolscap 8vo, pp. 378. Price: 7s. 6d. net.

ATTAINING MANHOOD: A DOCTOR TALKS TO BOYS ABOUT SEX, by G. W. Corner, M.D.; 1938. London: W. Heinemann (Medical Books) Limited. Crown 8vo, pp. 78, with illustrations. Price: 6s. net.

PRACTICAL PHYSIOLOGICAL CHEMISTRY FOR MEDICAL STUDENTS, by G. M. Wishart, D. P. Cuthbertson and J. W. Chambers; Second Edition, revised; 1938. Glasgow: John Smith and Son Limited. Crown 8vo, pp. 128. Price: 4s. net.

PHYSICAL DIAGNOSIS, by R. C. Cabot, M.D., and F. D. Adams, M.D.; Twelfth Edition; 1938. London: Baillière, Tindall and Cox. Medium 8vo, pp. 858, with 390 illustrations. Price: 22s. 6d. net.

MEDICAL RESEARCH COUNCIL OF THE PRIVY COUNCIL SPECIAL REPORT SERIES NUMBER 231: REPORT ON RADIUM BEAM THERAPY RESEARCH, 1934-38, by C. A. P. Wood, L. G. Grimmett, T. A. Green et al.; 1938. London: His Majesty's Stationery Office. Medium 8vo, pp. 78, with illustrations and coloured plates. Price: 4s. net.

RHEUMATISM, by B. S. Nissé, M.D., M.R.C.P.; 1938. London: John Bale Medical Publications Limited. Large crown 8vo, pp. 168. Price: 6s. net.

TRIUMPH OVER PAIN: THE STORY OF ANÆSTHESIA, by R. Fuller-Miller, translated by E. and C. Paul; 1938. London: Hamish Hamilton; Australia: Angus and Robertson Limited. Medium 8vo, pp. 438, with illustrations.

THE QUEEN CHARLOTTE'S TEXTBOOK OF OBSTETRICS, by Members of the Clinical Staff of the Hospital; Fifth Edition; 1939. London: J. and A. Churchill Limited. Medium 8vo, pp. 655, with four coloured plates and 293 text figures. Price: 21s. net.

STATISTICAL METHODS FOR RESEARCH WORKERS, by R. A. Fisher, Sc.D., F.R.S.; Seventh Edition, revised and enlarged. Demy 8vo, pp. 370, with illustrations. Price: 15s. net.

CATALOGUE OF LEWIS'S MEDICAL AND SCIENTIFIC LENDING LIBRARY. PART I: AUTHORS AND TITLES; new edition, revised to the end of 1937. Demy 8vo, pp. 558. Price: 16s. net.

EXERCISES IN THE BATH. THE TOGNA SYSTEM OF HOME GYMNASICS TO PROMOTE HEALTH, PREVENT DISEASES AND PROLONG LIFE, by T. R. Togna, with an introduction by L. Hill, M.B., F.R.S., LL.D.; 1938. London: Putnam and Company Limited. Large crown 8vo, pp. 133, with illustrations. Price: 5s. net.

HEALTH IN MIDDLE LIFE, by E. Browning, M.D.; 1938. London: Rich and Cowan Limited. Foolscap 8vo, pp. 249. Price: 3s. 6d. net.

SCARLET FEVER, by G. F. Dick, M.D., D.Sc., and G. H. Dick, M.D., D.Sc.; 1938. Chicago: Year Book Publishers Incorporated. Large crown 8vo, pp. 149, with illustrations. Price: \$3.00 net.

RECENT ADVANCES IN FORENSIC MEDICINE, by S. Smith, M.D., F.R.C.P., D.P.H., and J. Glaister, M.D., D.Sc., J.P.; Second Edition; 1939. London: J. and A. Churchill Limited. Large crown 8vo, pp. 264, with 85 illustrations. Price: 15s. net.

Diary for the Month.

- JAN. 25.—Victorian Branch, B.M.A.: Council.
 JAN. 27.—Queensland Branch, B.M.A.: Council.
 FEB. 1.—Victorian Branch, B.M.A.: Branch.
 FEB. 1.—Western Australian Branch: Council.
 FEB. 2.—South Australian Branch, B.M.A.: Council.
 FEB. 3.—Queensland Branch, B.M.A.: Branch.
 FEB. 7.—New South Wales Branch, B.M.A.: Organization and Science Committee.
 FEB. 10.—Queensland Branch, B.M.A.: Council.
 FEB. 14.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
 FEB. 21.—New South Wales Branch, B.M.A.: Ethics Committee.
 FEB. 22.—Victorian Branch, B.M.A.: Council.
 FEB. 23.—South Australian Branch, B.M.A.: Branch.
 FEB. 24.—Queensland Branch, B.M.A.: Council.
 FEB. 25.—New South Wales Branch, B.M.A.: Medical Politics Committee.

Medical Appointments.

Dr. G. Phillips and Dr. R. A. Money have been appointed Honorary Consulting Neuro-Surgeons at the Psychiatric Clinic at Broughton Hall, Sydney.

The undermentioned have been appointed Resident Medical Officers at the Adelaide Hospital, Adelaide: Dr. R. C. Angove, Dr. A. G. Campbell, Dr. E. P. Cherry, Dr. J. de Vadas, Dr. R. H. Elix, Dr. F. J. Fenner, Dr. J. F. Funder, Dr. J. A. Game, Dr. D. Gild, Dr. W. M. Irwin, Dr. J. R. Magarey, Dr. I. L. Miller, Dr. M. C. Newland, Dr. D. W. Shepherd, Dr. D. T. Shortridge, Dr. J. R. Thompson, Dr. J. C. Yeatman.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser", pages xiv, xv, xvii.

BALONNE HOSPITAL BOARD, ST. GEORGE, QUEENSLAND: Medical Officer.

METROPOLITAN INFECTIOUS DISEASES HOSPITAL BOARD, ADELAIDE, SOUTH AUSTRALIA: Resident Medical Officer.

ROYAL PRINCE ALFRED HOSPITAL, SYDNEY, NEW SOUTH WALES: Honorary Officers.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

| BRANCHES. | APPOINTMENTS. |
|---|--|
| NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney. | Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmmain United Friendly Societies' Dispensary. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phoenix Mutual Provident Society. |
| VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne. | All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria. |
| QUEENSLAND: Honorary Secretary, B.M.A. House, 235, Wickham Terrace, Brisbane, B.17. | Brisbane Associate Friendly Societies' Medical Institute. Proserpine District Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL are advised, in their own interests, to submit a copy of their Agreement to the Council before signing. |
| SOUTH AUSTRALIAN: Secretary, 173, North Terrace, Adelaide. | All Lodge appointments in South Australia. All Contract Practice Appointments in South Australia. |
| WESTERN AUSTRALIAN: Honorary Secretary, 205, Saint George's Terrace, Perth. | All Contract Practice Appointments in Western Australia. |

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